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Vol. 2

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Archive

The Subscription Magazine for Archimedes Users



RISC-OS Package is Here!

RISC-OS Hints & Tips

Which Computer? Show Report

SYS and the RISC-OS Sprite Editor

Languages, BBC Compatibility, BASIC V Forum

Reviews: ARC PCB, ArcTrivia, Overload Game,
Cheat it Again, Shareware 4 Disc

Hints and Tips – 7 pages of them!



Still too much material to fit in

Even though we have again added four extra pages, there still is not enough space to fit in all the contributions we've been sent, so apologies to those folk whose articles didn't make it but I'll try to fit them in next month. The fact that I have left your article until next month does not mean I don't value it. There may be many reasons for leaving it over – often, it's just that I need to get articles of just the right length to fit into a particular space. Yours might have been too long (or too short).

Thanks again to all the contributors... and to the readers... for making Archive possible.

"What will you do with all the money?"

Because of the wonderful way you have all supported the Archive magazine and bought lots of software and hardware through us, we now have more income than Sue and I and the boys need to live on. So, what we are going to do with the extra? Buy a BMW? or a Porsche? Well, no, our 13-seater minibus is much more practical and the moped is better than a BMW for nipping into the city.

Seriously though, there is an excess of cash which is why we reduced the profit margin on the larger items of software – but all that did was encourage more people to buy their software from us! One idea we have been thinking about for a while is to set up a Charitable Trust with the aim of providing financial sponsorship for short term aid/educational projects in third world countries. Although this is not a definite proposal, we feel that it is basically the right sort of thing to do; it's just a case of putting flesh on the bones of the idea.

We will give you more details as things develop, but we're all very excited about the project. Anyone who has any advice, comments (which includes criticisms, please) or ideas, please write in to us. However, may I ask you NOT to telephone because otherwise we could find that we were spending so much time discussing the project that the standard of service we try to provide was deteriorating and obviously we want to avoid that.

"How can I help?"

If you feel you would like to be involved, the most obvious way are to continue to support the magazine itself by renewing your subscription when appropriate, by sending in articles and comments, by buying your software etc through us and, if you are a soft/hardware producer, by advertising your wares through us. Those of you who believe in the power of prayer, could pray that we will be guided into the right way to use the extra cash.

*"If anyone has material possessions and sees his brother in need but has no pity on him, how can the love of God be in him? Let us not love with words or tongue only, but with actions and in truth."
(1 John chapter 3 verses 17 & 18.)*

With very best wishes,

Paul B.

Archive

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Hardware & Software Available

• **Archimedes A205???** – The growing rumours of a new 'Amiga basher' are fueled again this week by a detailed report in the Times Educational Supplement, which largely concurs with other details circulating at the moment. The main points are:

- Aimed for junior schools who can't afford current Archimedes prices (which are going up anyway!)
- 1Mb expandable to 2Mb
- Would include a userport, for things like Concept Keyboard
- Around £500 – £700 (+VAT)
- One box, with a disc drive at the side
- Will run under RISC-OS

I suspect that by the time this magazine gets into your hands there will be some more definite news. Give Eureka a ring for the latest news.

• **Archimedes Prices Rise** – The prices of all the Archimedes computers went up on 1st April. So, anyone wanting to save money by getting RISC-OS "free" by waiting until after 1st April is in for a disappointment. Instead of paying £36 for the upgrade, you will have to fork out an extra £74 for the basic A310 without a monitor. All the other prices have gone up too but, at the time of writing (March 27th) we don't know all the other prices. (This does point up the importance of Eureka Bulletin boards. The news of the price rises was given on both Eureka I and Eureka II in early March.)

• **Archive Index Disc** – Yes, we too have found it a real nuisance not to be able to find a particular hint or article when we want it, so in response to a Help plea, Jim Poll, Paul Hobbs and Alex Hopkins have come up with an Archive Index on disc – two in fact – one of them is self-standing and the other is a set of data files that runs under Beebug's ArcScan program. (You can get a copy of ArcScan from Beebug by buying their RISC User special disc which costs £13.16 or £12.50 to R.U. members.) The Archive index is being distributed as Shareware disc N°7 and costs £3.

• **Computerware hard discs for export?** – I'm afraid that, as we said in the magazine a couple of months ago, we cannot export the Computerware hard drives because they are imported from the U.S.

under a special licence agreement. We can, however, export the podules and they include all the metalwork for mounting a standard off-the-shelf ST506 3.5" hard drive, which you could buy locally. The cost of the podules without VAT but including postage and insurance is £215 to Europe (£221/£223/£224 to the other areas of the world). If you have a 4-slot backplane as well, it comes to £264 for Europe and £270/£273/£275 for the rest of the world.

• **Euclid 3-D graphics package** – Ace Computing has now produced a new multi-tasking RISC-OS-only version with several added features, £70 inc VAT. Then there is Mogul, a "film-making" add-on allowing Euclid's 3-D objects to be added in an animated sequence to 'scenery' created in an artwork package. Mogul is available to registered Euclid users for £20 inc VAT.

• **Hard discs** – The Archive price of the Computerware 40M internal drive (with podule) has dropped from £680 to £590, inclusive. This is because the price of drives is very much dependent on the quantity you buy and, now that the sale of 40M drives is beginning to catch up on 20M's, Computerware have been able to get a better price which they have passed on to us. (Even at £590, the price of the internal 40M drive is high compared to the 40M external. The reason for this is that the external one is a 5.25" drive which would not fit inside the computer but which is rather cheaper to buy than the 3.5".)

• **Watford Hard Drives** – During April, Watford will be selling their new 40M hard disc plus podule for £499 + (£7? carriage) + VAT = £582 which just beats Computerware's price of £590 inclusive through Archive. However, after April, their price goes up to £525 (£611 inclusive) so the Computerware 40M drive will then be cheaper.

• **Image Processing** – Wild Vision's new Hawk V10 system, starting from £650 + VAT, provides "affordable, high-performance image processing". It captures, stores and displays four separate images – 256x256 by 8-bits with 256 levels of grey scale – in real-time and totally independent of the host machine, leaving the computer to do the complex

calculations needed for fast image processing. Colour can be achieved by doing separate scans for red, green and blue. The board uses a separate monitor to display the video and the controlling software is in a ROM on the board. (See picture below.)

• **Mornington Crescent** – Following my comments last month about the Mornington Crescent game, Mike Cook has sent us what is, admittedly, a text-only BBC implementation but it runs on the Archimedes. I've tried to play it and have found it to be such a good implementation that I cannot beat it. However, it does look as if he is playing under the rather unusual "Cringelford Conventions" and no explanation of these is given, so anyone not used to playing that particular convention may not be able to get very far with it. Anyway, for what it is worth, we've put it on the program disc for free distribution. Mike is not making any charge, but if you do find the program useful, perhaps you would give an appropriate donation to charity. (How about someone combining Mike's algorithm with the Underground map from Shareware N°3? It would give it tremendous visual impact. Any offers?)

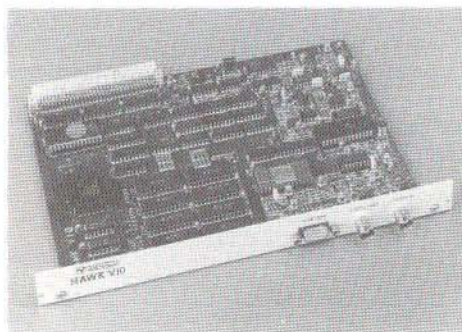
• **Ram upgrade for A305** – It has been impossible to get these upgrades for almost a year now through the official Acorn channels. I heard a rumour that some were coming available, but when I enquired at the distributor level, they were pessimistic – some even said it was "discontinued". I consulted Acorn and was told by an Acorn spokeswoman that "this product has been discontinued", "Surely not?!?", "I will check... yes, definitely", "You can't do

that!!!". Then after a bit of telephoning and stirring, they decided that I had been misinformed and that in fact they are in stock at the warehouse ready to go out to distributors... well, there were actually 30 sets of chips available! Anyway, to cut a long story short, we are still waiting for upgrades we have ordered through the official channels but have found an alternative source and I have about 10 sets **IN STOCK** – £159 each. (I suggest you telephone to confirm their availability before sending cheques.) *Stop Press!! 4 sets of genuine Acorn 0.5 meg upgrades have just arrived!!*

• **ScanLight** – Computer Concepts' 200 dots per inch scanner (£449 + VAT) (£490 inc VAT and carriage through Archive) is the scanner part of their Fax Pack (which won't be available before May). If you buy the scanner, it will enable you to scan pictures for inclusion in your programs as sprites or in your documents using First Word Plus or whatever or into PAINT or other art packages. (Or in Impression – CC's DTP package which is also scheduled for May-ish.)

The scanner is A4 width and can be supplied with an optional sheet feeder (£150 + VAT) (£165 through Archive) which makes it easier to avoid a skewed picture. The controlling software, which is included in a ROM on the controller board, is WIMP based and allows scanning in monochrome (best for text) and half-tone (best for pictures). The image can be viewed in mono or 16 level grey scale and the pictures can be edited a pixel at a time using up to 999% zoom magnification. (We actually have a Scan Light here in the office. It is very easy to set up and quite fun to use. We'll try to do a review in due course.)

(People have asked about whether the Fax Pack could be used in place of an ordinary modem since it runs at up to 9600 baud. The bad news is that the modem is synchronous whereas those used for accessing Prestel or whatever are asynchronous so they can only talk to similar devices. The good news is that when the Fax Pack receives a signal, it tries to interrogate the



The Hawk V10 expansion card for the Archimedes computer

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sender to see if it too is a CC Fax Pack. If it is, it exchanges a few pleasantries and then it can be used for straight file transfer between the two computers.

- **Scorewriter from EMR**, £499 + VAT provides high quality music output to a laser printer. You can produce bar lines, multiple staves, clefs, ties, accidentals and lots of other things I have never even heard of! The music is transcribed by creating a text file using letters for the notes and all sorts of symbols for the timings and other marks. It sounds a bit laborious to create the scores – it isn't WYSIWIG, though you can do on-screen previewing. The output is very impressive – you would think it was "proper" printed music. We haven't been able to get a system to review (not even to borrow one to try on our LaserWriter) but the sample of output we were sent looked good. (We are not quoting an Archive price, but if you want one, let us know and we will see what we can do.)

- **Shareware 5** disc is now available which consists of lots of music for the Welcome disc

Music Editor. There is classical, modern and even some greek music.

- **Shareware 6** disc is not going to be far behind. It is specifically a disc for users of First Word Plus and contains things like printer drivers etc.

- **Teletext Adaptor** – Solidisk have improved the software for their Teletext Adaptor and they will send you an up-date if you send your disc back. Unfortunately, judging by the comments we've had so far, although it is a bit better than it was, there are still problems. Solidisk have been informed of the problems and are, hopefully, looking into them.

- **Yes, Chancellor** – a business simulation program in which you run the British economy! £17.50 + 50p p&p from Topologika. Uses the PC emulator. (Also available from the same stable are 'Countdown to Doom', 'Acheton', 'Philosopher's Quest' and 'Kingdom of Hamil' on a single 3.5" MS-DOS disc (£19.95 + £1 p&p) and 'Giant Killer' using BBC emulator (£19.50) and 'Return to Doom' (£17.50) on MS-DOS.) **A**

! NEW !

DiscTree Search and Save

for
RISC OS

Easy Backup

Do you back up your data? Does your current backup method copy large files over several floppy discs?

- DiscTree allows you to specify the files to be backed up by matching name, type and date,
- Save your criteria for repeated use, double click the file and the backup starts,
- Copies files to multiple discs, if required.

Easy Search

Tired of opening and closing many directory windows to display the directory you want?

- DiscTree displays entire directory structure of a local disc in a single window,
- Immediately open a directory display on the directory you want, or start an application.

Can't remember where you stored a file?

- DiscTree allows you to search all, or selected, directories for files matched by name and type.

Easy Restore

If you've just deleted an important file by accident, just reach for your backup discs.

- All the files stored on a backup disc are displayed in a single window,
- Restore single files by dragging to the required destination,
- Restore all files to their original locations

DiscTree runs only under RISCOS and costs £49.95 (inc. VAT and P&P).

Available late April 1989.

If you use a hard disc, DiscTree is a must, order your copy NOW.

Available from:

Mitre Software Ltd.
International House
26 Creechurch Lane
London
EC3A 5BA.

or your local dealer.

Hints & Tips

• **BBC winchester on Archimedes!!** Alan Glover says... I have got it to work on the i/o podule under RISC-OS. Here's what you do: from the !65Host directory:

```
*RMLoad !RunImage
*CACHEROM 0 dnfs
*CACHEROM 1 ARFS
*CACHEROM 2 <>.ADFS130
*EMU.
```

Note: Must be ADFS 130—i.e. a B/B+ version and you must find an image of this yourself as it is not provided with RISC-OS. To use the Archimedes' ADFS type *ARFS.

The winchester is connected to the 2 MHz bus (theoretically 1 MHz!) on the I/O podule as it would be on a BBC.

• **Configuration problems in Art Nouveau** – If you select 'Configure machine' from the opening menu when you have already configured the machine, you lose your old configuration when you quit and you are left with Art Nouveau's own configuration. This is because it doesn't keep track of whether you have already configured it. I was lucky – I had written a program long ago that translates a *SPOOLED *STATUS into a load of *Configure's and I keep a copy of this spool on my hard disc at all times. You have been warned. Martyn Lovell.

• **Graphic Writer with a Star SG-10** – If you can have one complaint about Graphic Writer (apart from the manual) it's the printer support. I own a Star SG-10 and am trying to let Graphic Writer use it to the full. The Star has an NLQ character set, but this cannot be combined with any other text style except underlined. So what I want is to adapt the printer driver so that it would normally print NLQ and for the other effects resort to draft printing. For this, I used the Printcon program and gave the following codes:

```
Initialisation:
ESC "@"
ESC "G"
ESC "4"
```

Which resets the printer, turns on double-strike (gives better bold, but you may omit it) and NLQ. Make sure the printer is in IBM mode.

For configuration (leave the rest the same as a FX80):

```
Plain: 27,70,27,52
Bold: 27,53,27,69
Italic on: ESC "I",1
Italic off: ESC "I",0
```

Note that the input routine of the printcon program doesn't accept two "ESC" sequences on one line, but it accepts two 27's. The italic codes are different from an FX80. In fact, FX80 compatibility turns out to be somewhere in between the "Star" and "IBM" modes of the Star SG-10. The trick is the plain and bold codes. When Graphic Writer finds a "Bold" code it now also sends an NLQ-off code to the printer, which in effect makes the printer print in draft, emphasized and double-strike, the latter being already set at initialisation. (Yes, it is confusing, isn't it?!) This makes it possible to mix NLQ, bold and italic-bold in the text. However, you can't use italics or super/subscript without bold. These just print in normal NLQ.

The same method should apply to other printers which can't do everything in NLQ.

Another tip on Graphic Writer is that you should always make any graphic as big as possible, i.e. use the whole graphic area, however small you want the picture to be. This makes page composition a lot easier and also causes less problems with distortion when rescaling.

• **Interrupt module** – The interrupt module by Steve Hoare (Archive 2.6 p44) is very useful especially, as he states in his article, with First Word Plus for creating directories etc. However there is a problem associated with *interrupt 0. This is that the pound key also generates ASCII 0 (a bug in OS1.2 I think) which means that every time you type a 'pound', the interrupt module takes over and opens up the OS window. However, <ctrl-O> is unused by First Word Plus, so I use *interrupt 15 instead.

The module also comes in handy when using a comms program to check on filenames, *type logfiles etc, but there is an enhancement that I think would make it more useful still. While in the OS window, it is possible to type <ctrl-Z> to open up the text window to the full screen which is handy, but on exit (in a WIMP program) only the top half of the screen is restored. If the source code could be modified to issue a redraw request for the whole screen it would be an improvement. Having looked at the code, it should be easy to do. Any offers?

• **Memory shortage on Logistix and First Word Plus** – To get round the 'out of memory' snag which seems to turn up so often with First Word Plus and Logistix, if you have the 1.20 PC emulator, use the PC.PC startup routine first and then, instead of using the MS.DOS disc, insert Logistix instead and <reset>. <Ctrl-break> will then autoboot Logistix with a whole 275k of memory free to use.

• **Mitsubishi Disc Drives** – Here are a number of points to bear in mind, writes Vic Budd, when adding external disc drives. If, after considering these, you feel competent to carry out the work, go ahead. If not, it is prudent to entrust the work to an experienced operator to avoid frustrations and disappointments.

There are different circuit board layouts, but the basic checks on the drives are the same.

1. Remove link MS if made and change to adjoining position MM.
2. Remove link IU if made and discard it. On some drives there is no removable link. However, there is a circuit board foil link, DI, near the data cable edge connector, which is connected to pin 2, and this should be cut in these instances.
3. Move drive selector link to position 1, 2 or 3 according to which command you wish it to respond. (This assumes that the internal drive is to be 0).
4. The resistor pack should be in place. On some drives this consists of a single plug-in IC type device, whilst on others there is a row of DIL pins which should have shorting links inserted.
5. Make sure the data cable is correctly orientated – it will need to be at 180 degrees compared to the three and a half inch drive connectors.

6. If, as I do, you wish to run a second three and a half inch external drive and a five and a quarter inch drive, the connecting cable will, of course, need to be turned through 180 degrees to connect the drives together.

7. If you decide to use the Archimedes' power supply, check the connections carefully before attaching the cable connectors, making quite sure you do not get the 12v and 5v leads confused.

If you do all these things correctly, you too should have no problems with the Beebug lead and will be able to access drives A, B and C under the PC Emulator, as well as 0,1, and 2 under 'native' Archimedes.

• **Moving the pointer** when it is not linked to the mouse can be greatly simplified by using the POINT TO x%,y% command which does exactly what is needed (note that you must unlink the pointer from the mouse first with MOUSE ON 129). Details are in the User Guide and under HELP POINT. Having looked at the relevant part of the PRM, it appeared to be impossible to do this, so I decided to have a rummage around in the BASIC module. This resulted in the discovery of some undocumented calls! Basically these are extensions of OSWORD &15 whereby putting &05 instead of &03 at R1+0 causes the pointer position to be set instead of the mouse position (see PRM p.133). Also, values of &04 and &06 appear to read the mouse and pointer positions respectively, though the code to read the mouse position contains a fatal bug in Arthur 1.2 and cannot be used! In theory it might be possible to patch it with a copy of the UtilityModule in RAM but this module refuses to be RMKILLED. Martin Simmons

• **Problems with *UP** – If you are having problems (as expressed in the Help Section last month) with *UP or the use of ^ in a pathname, it is probably because of a bug in the ADFS. The problem occurs when a directory is renamed. The ADFS does not seem to keep track of it properly. The solution, apparently, is to do a *COMPACT on the disc.

• **Repton 3 again** (Philip Armstrong) – I've got a few more comments on Repton 3. Firstly I hope that no one saved the new characters and maps onto the original disc. I have found that occasionally, the

maps have been corrupted and thus rendered impossible. If you find a screen that you can't do then check it with the original version. For those people that can't get to grips with the array of different characters, create a second disc with all the files using a standard set of characters. This makes the screens easier to complete. I have included on the monthly program disc, the new characters that I use. They are not brilliant, but a distinct improvement on the original set. Superior Software only state that characters and maps cannot be used for commercial exploitation, so it is OK for us to distribute in this way. There is also a simple program to merge maps and my characters. Also, if you cannot stand the tune that accompanies the loading program of Repton, then change *tune1 to *tune0 in the "config" file.

Here is a list of Passwords for Repton 3. Sorry it's not complete, but I do have other things to do. If anyone can do screen E of WORK (p=scratch), I'd be pleased to hear from them because it looks impossible and I have checked it against the original. I suspect a transporter has been defined wrongly.

A Prelude	B Rescind	C Periwig	D Mortify
E Forsake	F Gratify	G Thistle	H Spangle

A Toccata	B Nocturn	C Liberal	D Inspect
E Delight	F Botanic	G Vitriol	H Sacking

A Finale	B Yardarm	C Zealous	D Without
E Aviator	F Elderly	G Juniper	H Crimson

A America	B Herbage	C Kitchen	D Outcast
E Quarter	F Untwine	G Tremble	H Strange

A Arctic	B Kinetic	C Gondola	D Lozenge
E Rotunda	F Frontal	G Younger	H

A Orient	B Organic	C Armhole	D Visible
E Neglect	F Biplane	G H	

A Oceans	B Distain	C Mundane	D Eclipse
E Warning	F G	H	

A Africa	B Quickly	C Zigzags	D Closely
E Panoply	F Bonfire	G H	

A Baby	B Startle	C Measles	D Granite
E Whimper	F Cushion	G Alimony	H Utensil

A School	B Qualify	C Knicker	D Dynamic
E Tendril	F Lanyard	G Vinegar	H Yaskmak

A Teenage	B Eternal	C Whisper	D Feather
E Rhubarb	F Jasmine	G H	

A Work	B Inverse	C Parapet	D Elegant
E Scratch	F G	H	

A Oap	B Jackdaw	C Rupture	D Archery
E Figment	F Natural	G Tonight	H Brigade

A Prehist	B Dormant	C Mineral	D Varnish
E Dashpot	F Lobelia	G Upright	H

A Egypt	B Lobster	C Tabloid	D Achieve
E Gristle	F Deceive	G Scalpel	H

A Victori	B Earnest	C Pervade	D Violent
E Bashful	F Magnify	G Wrought	H Horizon

A Now	B Charity	C Funeral	D Justify
E Naughty	F Isolate	G Radical	H

A Future	B Primate	C Mustang	D Iterate
E F	G H		

• **Shared C Library** – Users of release 2 of ANSI C might like to know how to use the Shared C Library which is included on the disc but which does not seem to be documented in the User Guide. Normally, the AOF file, generated by compiling the C source, is linked with the C ANSI library file, \$.ARM.CLlib.O.AnsiLib. This produces an image file which can be executed directly by *RUNning it. This image file tends to be quite long as large portions of the C ANSI library are incorporated in it.

On the C disc, is a file called \$.Library.CLlib which contains the C ANSI library in the form of a relocatable module. The interface between the user program and this Shared C Library module is a small file called \$.ARM.CLlib.O.Stubs which simply defines each ANSI library function as a SWI which is then recognised by the library module.

As an example of the use, try the following. Mount your working copy of the C disc and enter directory \$.ARM.CBench. Now compile the source file C.HelloW using the -c option so as not to invoke the linker:

```
*CC HelloW -c
```

Now link the resulting AOF file with the Stubs library:

```
*Link -o HelloW O.HelloW  
$.ARM.CLlib.O.Stubs
```

Hints & Tips

Next load the Shared C Library module:

```
*RMLoad $.Library.CLib
```

And finally run the program:

```
*Run HelloW
```

Note that an image file generated in this way is not truly stand-alone as it needs the Shared C Library module to be loaded in order for it to run (but then again many programs need the Floating Point Emulator to be loaded in order to run). A big advantage is that the image file is very much smaller than it would be if it had been linked with the ANSI library in the normal way. One can envisage several C programs multitasking under RISC-OS, sharing the resources of the Shared C Library.

It should be noted that the Arthur-specific functions declared in the ArthurLib header file are not incorporated in the Shared C Library. If your program uses these functions you must include \$.ARM.CLib.O.ArthurLib at the linking stage. So try the following:

```
*CC Balls64 -c
*Link -o Balls64 O.Balls64
$.ARM.CLib.O.Stubs
$.ARM.CLib.O.ArthurLib
*Run Balls64
```

Provided the Shared C Library module is loaded, the program should run normally. John Morley

• **Sprite Animation** – There have been many articles relating to the use of Sprites on the Archimedes. These have covered the use of PLOT &ED,X,Y to display a Sprite in its defined colours at point (X,Y) and the use of a Mask to allow a background to appear through the 'unused' parts of a sprite. They have also shown the use of Exclusive OR plotting using GCOL 11,0 to allow the sprite to be moved over any coloured background.

The EOR solution to this last problem, of moving a multi-coloured sprite over a multi-coloured background, does work, but unless a great deal of thought is given to palette selection, the sprite does not retain its defined colour during movement.

Many games will require the facility to define a sprite in specified colours, with a mask and to move it still retaining those colours rather than those produced by EOR.

A solution is to use the standard Move/Display/Erase in a loop but not to use EOR. The following algorithm does this :

- 1 Define the sprite 'MySprite' with a mask (using SEDIT on the Welcome Disk).
- 2 Determine the size of 'MySprite'. This may be known but a SYS call does it for you.

LOOP

- 3 Determine the position where 'MySprite' is to be plotted.
- 4 Grab a sprite 'Temp' from the screen at this position the same size as 'MySprite'.
- 5 Plot 'MySprite' with the mask.
- 6 Plot the grabbed sprite 'Temp' to ERASE 'Mysprite'.

ENDLOOP

The following program demonstrates this :

```
10 REM > SpritePlot
20 REM Copyright Ian Smith
30 REM March 1989
40
50 REM An example program to show
   the use of sprites moving
60 REM across a multi coloured
   background by grabbing an area
70 REM of screen as a sprite and
   then using it to overwrite the
80 REM moving sprite.
90
100 MODE 15 :REM Works in other
   modes
110 T$="Temp" : REM Will be the
   sprite grabbed from screen
120 M$="MySprite" : REM A masked
   sprite created with SEDIT
130 *SLOAD !Sprites
140
150 SYS &2E,40,,T$ TO ,,,W,H :REM
   Find size of sprite to grab
160 : REM W)idth and H)eight
170 PROCDrawBackground : REM Draw
   a Multicoloured background
180 PROCTitle:REM and put titles on
190
200 REPEAT
```

```

210 REM ***** MOVE *****
220 MOUSE X,Y,B
230 SYS &2E,16,,T$,1,X,Y,X+W*2,
      Y+H*4 : REM Grab sprite
                from screen
240
250 OSCLI("SCHOOSE " + M$) :REM
      Select original sprite
260
270 REM ***** DISPLAY *****
280 GCOL 8,0 :REM Now plot it with
                its mask
290 PLOT &ED, X,Y :REM at the
                mouse position
300 PLOT &ED,900,800 : REM and
      display it in rectangle
310
320 WAIT:WAIT : REM Synchronise
                output
330
340 OSCLI("SCHOOSE " + T$) :REM
      Now plot the grabbed sprite
350
360 REM ***** ERASE *****
370 GCOL 0,0
380 PLOT &ED,X,Y : REM at the same
                place
390 PLOT &ED,1000,800 :REM and in
                its rectangle
400 UNTIL B=7 : REM 3 buttons
                terminates
410 END
420
430 DEF PROCDrawBackground
440 GCOL 3 : RECTANGLE FILL 0,0,
      300,300 : REM Just a
                couple of
450 GCOL 4 : RECTANGLE FILL 50,50,
      50,50 : REM rectangles and
460 GCOL 12:CIRCLE FILL 800,400,200
      : REM circles
470 GCOL 5 :CIRCLE FILL 600,300,100
480 OSCLI("SCHOOSE " + M$)
490 PLOT &ED,75,90 : REM and the
                sprite
500 ENDPROC
510
520 DEF PROCTitle
530 GCOL 1
540 RECTANGLE 900-2,800-4,W*2+4,
      H*4+8 :REM Draw rectangles
550 RECTANGLE 1000-2,800-4,W*2+4,
      H*4+8 : REM in which sprites
560 PRINT TAB(53,2);"S P R I T E S"
      : REM are displayed
570 PRINT TAB(52,3);"original
                grabbed"
580 PRINT TAB(0,1);"SPRITE
      DEMONSTRATION : use mouse
                to move sprite"
590 ENDPROC

```

Comments on the program

PROCDrawBackground sets up a background to move over.

PROCTitle puts text and a couple of rectangles on the screen

150 uses a SYS call to find the Width and Height of 'MySprite'. This is needed so that the right size 'Temp' can be grabbed. (See PRM pp 429,433.)

230 grabs the sprite from the screen using a SYS call. Note the *2 and *4 to compensate for screen MODE 15. You'll need to change this for other resolution modes.

250 selects 'MySprite'

280 selects the Mask Plot option GCOL 8.

290 plots the sprite at the Mouse selected point

300 plots the sprite in a rectangle to show its original colours.

340 selects 'Temp'

380 plots 'Temp' effectively erasing 'MySprite'

390 plots 'Temp' in its rectangle. The effect of 390 has an interesting side-effect. When you run the program move the sprite over the rectangle! See what happens!

The program 'SpritePlot' and the sprite file 'Sprites' are on this month's disk but you can use the program by keying it in and also creating a masked sprite in mode 15 using SEDIT and saved as !SPRITES.

The program can obviously be modified to run in other modes. The flicker on the sprite could be

Hints & Tips

removed by modifying the program to plot only if the mouse has been moved. Ian Smith

• **Star-Trader Cheats** – Here are some ideas and cheats for 'StarTrader'. It is an excellent game, all the more impressive when you consider it is written in BASIC!

Load the main game and enter the EDIT editor. (The main game file is '\$.Resouces.StarTrader.StarTrader'.) You can alter as many as the following as you like to make the game a bit easier to get into;

Line 290 change to: SUN=1 for a SunBurst

DEATH=1 for a DeathBlossom

CELL=1 for a super energy cell

ENG=3 for the most powerful engines (Note ENG=2 & ENG=1 are available as well)

NUMPT=10 for the number of photon torpedoes. Having 10 doesn't spoil the display!

Line 390 change CRD to the number of credits you want (STDA is the stardate)

Line 420 change MAXHOL to the size of the hold you want fitted.

Note: DAMCAP is used in Line 13570 to calculate the remaining hold capacity.

PRC() holds the value of each of the tradegoods you are carrying CTOTAL is the total weight of cargo you are carrying at the moment (also used in 13570)

The messages you occasionally get when transporting down to a planet are held in code. If you want to see them, then type the following changes in immediate mode.

```
LOAD "StarTrader"
DELETE 0,39349
DELETE 39560,39580
DELETE 39640
DELETE 39650,39690
39351 DIM CMG$(20)
39554 FOR T=0 TO 20
39651 NEXT
```

PROCCLUE (If <ctrl-B> is used first, the messages can be sent to a printer.)

There is a 50:50 chance of getting a clue on any planet landing. 16 messages have a 95% chance of

being called, the other 4 messages only 5%. The rumour sends you to a randomly chosen planet! Some messages are tradehints, some are adverts for other games(!) and a couple are very useful clues to the solution of the puzzle.

The planets on which the segments are found and the code are chosen at the creation of the universe stage. RUN the game, then immediately save it. TYPE in CHEAT4 to get a list of planet numbers where the segments are. CHEAT4 also prints out the code letters. These are held in the array ZTX()

```
10 REM >CHEAT4
20 DIM PKLR(800),GR(800),ANAMES$(800),TYP(800),SS(800),PO(800),STARSS(120),PX(120),PZ(120),PC(9),SP(9),PRC(13),UNI(120,12),ZTX(8)
30 BB=OPENIN(":1.xxxxx"):REM
    change xxxxx to name of
    SaveGame file
40 INPUT# BB,SUN,DEATH,CELL,ENG,FS,PS,SS,AS,PTD,PSD,DAMCAP,HD,TE,NUMPT,PE,EPS,STDA,CRD,PN,SY
50 FOR T=1TO800:INPUT# BB,PKLR(T),GR(T),ANAMES$(T),TYP(T),SS(T),PO(T):NEXTT
60 FOR T=1TO120:INPUT# BB,SARSS(T),PX(T),PZ(T):NEXTT
70 FOR T=1TO9:INPUT# BB,PC(T),SP(T):NEXTT
80 FOR T=1TO13:INPUT# BB,PRC(T):NEXTT
90 FOR Z=1TO119
100 FOR T=1TO12:INPUT# BB,UNI(Z,T):NEXTT
110 NEXTZ
120 FOR T=1TO8:INPUT# BB,ZTX(T):NEXTT
130 CLOSE# BB
140 FOR LOOP=1 TO 9:PRINT PC(LOOP),SP(LOOP):NEXT:REM planets
150 FOR LOOP=1 TO 8:PRINTCHR$(64+ZTX(LOOP)):NEXT:REM code
```

You get a nice fanfare when you collect a segment. The percentage chances reported during a scan can be as low as 45% or as high as 90% on a planet which actually has a segment.

If you have two drives, it is quite easy to use drive 1 as the GameSave drive (as in the program above). Just change (input\$) in Lines 3770, 4020 and 4050 to ("1:" + input\$). Dave Kent

• **TV output from Archimedes?** – It is possible to connect a TV to an Archimedes, though only in monochrome and via a video. Connect a wire (co-ax) from a phono plug plugged into the Archimedes mono video socket to pin 20 (centre core of Co-ax) and any one of the many 0V lines (i.e. connect the braid screen to 0V) on a SCART plug. This means that it only works on video machines with a SCART socket on them (if no SCART socket, then connect to VIDEO IN via a phono or BNC plug). This also means that you can make demo videos and stuff by taping the pictures. Sound can be connected to pins 2 and 6, I think, never tried it! (See Archive 2.2 p 6) Does anyone now how to convert the Archie mono out to colour? Plugging the Archie SCART cable to the video doesn't work! Oliver Cornes.

• **Using First Mail** – At first, I regarded First Word Plus as a very ordinary word processor. The need to keep reformatting with <f12> seemed to be a step backward. However First Mail changes the picture for me. Here are one or two ideas on how to use First Mail for handling ordinary day-to-day correspondence.

I "merge from" a file carrying my letterhead. In fact I have a few different letterheads for different purposes. In addition to the letterhead my "from" file has the following First Mail commands:

longdate

input "address file?", address

input "text file?", text

includefile dat.address

Dear

includefile doc.text

includefile dat.address

(The bits in italic that should be in light type. It is not obvious which the light bits should be; but see the note on p. 206 of the First Word Plus manual.)

The system asks me for an address file and then a file containing the text of the letter, both of which it

merges with the letterhead. The second printing of the address comes after a hard page break. Since I specify pauses on page breaks, this allows me to remove the letter from the printer and replace it with the envelope (or sticker) for the second address to be printed on that. I can cancel this when I do the draft copy, which I keep for my own files. I save my letter texts in the doc directory and addresses in the dat directory. This allows me to use the same name for both if that is more convenient.

Incidentally I use a brother daisywheel for most of my letter quality printing; and I have configured the driver to print my letterhead in bold red. A nice feature of First Word Plus is that you can have several drivers for the same printer if you give them different names. Not only that, but with a daisy-wheel you can have two configurations on the same driver by making the NLQ configuration different from the draft configuration, though of course, the terms draft and NLQ will have no real meaning for a daisywheel.

There are some errors in the Brother driver supplied, by the way; so check with the manual, especially if you are Danish or are in the habit of using some of the more obscure symbols. The First Word Plus manual is a bit vague about full pathnames, too. For instance, to install a different default printer you have to type, say,

*copy lwp.cfg.epson_fx resources.


lwp.lwp_print

I find the First Word Plus file window most useful for exploring discs. If you click on the window exit symbol you get the parent directory. Clicking on a directory name in the window lists that directory in the window as well as selecting it in the directory slot. Glyn Emery. **A**

Norwich Computer Services is growing again!

As from Monday 10th April, hopefully, there will be another friendly(?) voice to answer the phone – Ali Don is the name. She'll be trying to keep the rest of us in order, operating the new Mac II DTP system and handling the sales side of things – a Jill of all trades!

Help!!!

- **Accents in System Delta Plus** – Is it possible to get SDP to produce accents such as “à”? I can do it on First Word Plus, so why not SDP? Antony Gordon, St Albans.
- **Ancestry** – We are looking for someone to review Minerva's Ancestry package but we need someone who knows about family trees and such-like and who would actually use the package. We don't want someone who would just play with the package for the sake of doing the review. Any offers? Please ring the editor. Ta!
- **Aviator** – Has anyone any idea how to get Aviator working on a 310? H Luxton, Hastings, amongst others. (Perhaps it will work under 65Host?)
- **Blinking cursor!** – Does anyone know how to change First Word Plus' blinking cursor into, say, a steady block in a different colour? Antony Gordon, St Albans.
- **Decent quality keyboard?** – Is it possible to fit a decent quality keyboard onto the Archimedes? If so where can I buy it from? Laura Blackburn, Stourport.
- **Interrupt routine** – Please could you give me a routine that would simulate <escape> being pressed when the middle mouse button was pressed and also to simulate <shift> being pressed when the left button was pressed? M Ellis, Leicestershire.
- **LC10 colour dump** – Has anyone done a colour dump for the Star LC10? A Liekens, Belgium.
- **Machine code fade** – Rob Davison asked for one last month and Steve Jones referred us to the random number generator mentioned on page 561 of the PRM, but can someone put the two together for us? Or can someone make a machine code pseudo-random number generator that will go through just a big enough sequence of numbers that can be related to the actual screen locations that need altering.
- **Masterfile II** – Anyone able to advise on the use of Masterfile II on the Archimedes? H Potter, Leigh-on-Sea. (Perhaps it will work under 65Host?)
- **Multi-screen fastload** – The PROLOAD and PROSAVE commands in Pro-Artisan assume that you are NOT using screenbanks. Has anyone got a fastload routine that could load compacted Pro-Artisan screens into any (not necessarily the current displayed) screenbank? M West, London E7. (Mr West is offering a cheque for £50 or £100 to a named charity for this one! Ed.) (Too slow! I put this message up on Eureka II and Dave Clare responded accordingly, so £100 is on the way to Dave's favourite charity!)
- **Prolog** – Acorn's Prolog-X is a good implementation, but it's a pain having to go in and out of Twin. How do I get round that? Also, there are rumours of a new version from Acorn. Any news anyone? Ian Mackie, Pontefract.
- **Radio Ham programs** – Are there any? J Luxton, Hastings.
- **Three floppies on the desktop?** – Is it possible, please? Laura Blackburn, Stourport. (Answer given on Eureka II: Possible under RISC-OS.)
- **Writing games in machine code** – Could someone write an article about writing games on the Archimedes in machine code? It could include screen memory layouts, storing sprite data directly to the screen, methods of collision detection and how to achieve smooth scrolling. S A Wilson, Solihull. (Smooth scrolling, see below. Actually, this sounds like a whole series of articles, or even a book in its own right. Dabs, are you listening? Ed.)
- **Smooth scrolling** – Vertically, no problem – use the OSWORD which sets the screen base address. Horizontally is a problem. You can do it in 32 bit multiples, which isn't that smooth, although you could probably combine this with some VIDC twiddling to shift the horizontal pixel position for the subdivision of a word. You'll need the VIDC and MEMC data sheets for the required info. M.Harrison. 

Dabhand User News

Archimedes Basic Compiler Version 2 • Archimedes Operating System Guide Special Offers on Archimedes PC Emulator and ANSI C

ABC Version 2

Don't live on promises, buy the only true BASIC V Compiler currently available, and now in its second release! But don't take our word here's what the reviewers said:

"...Excellent Dabs Press product. Buy it!" RISC User Dec.88

"ABC is a vital part of any programmer's toolbox, it puts compilers on other systems to shame. Unquestionably one of the most impressive pieces of software I have yet seen running on the Archimedes." A&B Dec 1988

"...I can tell you now, I am very impressed. This is a superb package." Archive Dec 1988

The above quotes were referring to Version 1 of ABC – ABC Version 2 is even better! Version 2 allows use of double and extended precision floating point, multiple exits from procedures and functions, RETURN parameter passing, new compiler directives and very much more.

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Matters Arising

• ***DCopy misprint** – Archive 2.6, page 5, we missed out the word “copy”. It should have read:

*SET Alias\$DCopy COPY %0 :0.%0 PQ

• **4 Mbyte RAM upgrades for A310** (Archive 2.6 p3) – Mike Harrison writes... Yes, PLCC packages are tricky to remove and special tools are expensive. I've made a very effective extractor by filing down the jaws of a 'tongs' type DIL extractor (the type that sell for about a quid, which hook under each end of the chip) so that they fit down the 2 slots in the corner of the socket. As and when my 4 Mbyte upgrade becomes available (I've just got the prototype PCBs back), we hope to include a similar tool, although I would recommend anyone the least bit unsure to get it professionally fitted.

• **Dir/NoDir** – *NoDir unsets the current directory. This means that ADFS will access the disk when doing *Cat,*Ex etc. if the disk in the current drive has been changed. *mount or *DIR:<diskname> or <drivenumber> sets the current directory, and ADFS will assume the directory is in RAM and not look at the disk. When an operation needs to hit the disk, ADFS will try the drive where it first found the disk and then try other drives before finally giving a 'Disc not present' error. *Configure DIR makes ADFS try to read the catalogue of a disk in the configured default drive on a reset, *Configure NoDir prevents this, thus starting in the unset condition mentioned above. Usually Configure Dir is only useful with Hard Disks, (mainly to set up the library directory) and effectively just does a *Mount <defaultdrive> on reset. M.H.

• **Logistix IF problem** – Many serious users of the excellent Logistix package will have by now discovered the problem with the IF function. This was described by Tim Powys-Lybbe in Archive 1.10 p4. It tells how the following command +IF("abc"=0,1,0) causes a fatal crash in the program. The problem appears to be one of not spotting type mismatch errors. Obviously, the above example could be avoided but with a large spreadsheet with hundreds of inter-linking cells and functions, it can be difficult to avoid. There also appears to be a problem when replicating IF statements. Acorn have been made aware of this problem and say “it

will be dealt with when Logistix is next updated”.

• **Reset and Break** (2.6 p46) – Reset does a hardware reset to the CPU and devices on the podule bus and will exit from **anything**, although the machine may bomb immediately afterwards due to OS workspace being corrupt. Break on its own usually acts as an escape key, but acts as a reset if used with <shift> or <ctrl>. The action of the break key can be set with *FX247 (see PRM). The break key is unlike the reset button in that it acts in the same way as other keyboard keys, i.e. won't work if the machine bombs with interrupts disabled, or if it has been reconfigured with *FX247. On a break key generated reset, a service call is passed round the modules to allow podule drivers to reset their hardware, as the Podule reset line isn't asserted. <Ctrl-break> or <ctrl-reset> is close to a power-up reset, in that soft-loaded modules are cleared and things are generally initialised. Reset or break on its own only resets certain things, like the vectors and a few OS settings, and is a lot 'safer' (e.g. it doesn't trash the RAM disk). M.H.

• **ROM speedups** (2.6, p10) – Mike is of course right to say that it's highly unlikely for a ROM to blow up when run slightly faster. However, there is another more serious problem: Manufacturers rate chips at certain speeds because they have tested them at that speed after they have failed tests at higher speeds. I wouldn't run anything important with the ROMs speeded up like that any more that I'd buy one of these PC clones that use a 16 MHz 80386 running at 25 MHz.

• **Scanner update** – Mike Harrison writes... I'm doing an interface for a 4" wide unit which is switchable to 1, 2, 3 and 400 dots per inch and has 3 switchable patterns used to represent grey levels. The software will all be in a ROM on the interface podule and will appear as a RISC-OS resource on the Icon Bar whenever the desktop is run. Images can be scanned, scaled to any size, processed using edge detection and selective directional copying, and saved as sprites, optionally with anti-aliasing to give very good results even with small images. Price will be somewhere in the region of 130 to 200, availability in 2-3 months (hopefully!)

• **Shareware Author Bites Back** – With reference to Fred Smith's review of the **Cassette Inlay Printer** on Shareware disk 3, I have the relevant disk and naturally tried out the program as issued – looks OK to me! His remarks about program documentation are a bit of a puzzle though as his confusion about loading and saving inlays was probably caused by the lack of documentation. When you select load or save from the menu you are actually only storing the data in memory – to write it to disk you must exit via the 'exit' icon on the icon bar (this is better explained in the later versions). I can only assume that Fred exited the program via the reset button. 'Teenagers with hundreds of tapes' will also be disappointed with the program as it stands since only 100 inlays are allowed (this is documented!). The reason for this is that to create the icons required for the 'Select' window takes an appreciable amount of time although this could be improved. In conclusion, yes it works as supplied although it certainly has a few rough edges most of which I have now polished off!

As the author of the **Videotape Indexer** program I must say that I can't make it work either! If you run it from the menu, you get an address exception error. On my own system, the program fails occasionally but I have never been able to track down the cause. The version on Shareware 3 will run if you CHAIN the videobase program itself. Also, the program does not start up correctly with a fresh database. Apologies all round for this one, to correct it proceed as follows: CHAIN "Videobase" and create a dummy entry giving the tape number as 2. You will then be prompted to select a length. Do so, then delete tape 1 from the database and create another dummy entry for tape 1, selecting the tape length as before. Then set the 'hazard' and 'seen' flags (using the menu) for both the dummy entries. Finally, delete both dummy entries and you will be left with two 'empty' tapes with which to start your own database. If this does not make any sense, feel free to give me a call on (0268) 541170. Paul Hobbs.

• **Sprite areas** (2.6 p54) – The reason that you shouldn't use the system sprite area is that its size can't easily be changed without reconfiguring the machine. It was provided as a simple method of creating sprites during experimentation and development, but many people have made the mis-

take of using it in commercial software, requiring fiddly configuration sequences. There is NO excuse for not creating your own area, as it is so easy (1 line of BASIC), and allows simple allocation of memory (using DIM) within the application's memory space. Anyone using the system area in RISC-OS applications ought to be condemned to using Arthur 0.2 for the rest of their natural lives – careful allocation of memory is even more important – user sprites in the system area won't be deleted when application is removed/exited, thus wasting precious memory. Some of the fun new sprite operations in RISC-OS, such as scaling and anti-aliasing won't work on the system area – this is obviously a deliberate move by Acorn to persuade people that system sprites are *A Bad Thing*.

N.B. don't confuse the system sprite area with the RISC-OS WIMP common sprite pool, which is a different thing entirely. M.H.

• **WD40 on hard discs?** (Archive 2.6, p5) **ARRGHH!!! No! Don't do that!** It can form an insulating layer and negate the effect of the carbon pad which is supposed to avoid static build-up on the disc. **A**

Small Ads

• **ANSI C** (rel 2) £60, Logistix £60, Twin £16. All new in original packing, ring Damian on 01-303-8202.

• **First Word Plus** £60 – Ring Steve on (0480) 860613.

• **Graphic Writer** £12.50 o.n.o., Typing Tutor (Contex) £7.50, CC ROM board with battery backup and 1x32k ram (almost new) £55. Phone 01-579-0607.

• **Hoverbod** £7, Conqueror £12, Zarch £8, Artisan £15, Euclid £20, ArcImEd £10. Phone Miles on 01-733-9147.

• **Repton** £8, Conqueror £9, Hoverbod £7, All in excellent condition. Ring Alistair on (0482)-634852 after 6 p.m.

• **Software Developer's Toolbox** £150, brand new & unused. H.S.Takshak on (0753) 884981.

• **WANTED** – Multi-sync Mono monitor – Ring Steve on (0480)860613. **A**

Readers' Comments

• **Pseudo-code listings** (Archive 2.6, page 34) – I started to adopt this method of documentation about three years ago as part of my job and really appreciate this kind of program documentation. I find it allows almost anybody to modify unfamiliar BASIC programs much more easily than other forms of documentation. It is much better than REM statements or on-screen comments. It is the best (only? Ed.) advantage of having to use line numbers. Colin Garlick, Glasgow.

• **"Corruption" and "Life of Crime"** – We've had a number of comments about these programs, views being expressed on both sides of the debate. There seems to be no clear consensus as to whether such programs actually are offensive in any way. However, one common theme was a criticism of the editor which is summed up very clearly (and more gently than some!) by the following comment:

"I wonder if a parallel with literature might be helpful. As a private reader, I might very well decide not to buy, borrow or even read a book on the strength of what I gleaned about it from the dust jacket which might suggest to me that I might dislike it or find it morally offensive. However, if I were sent the same book and asked to review it, it would be unfair to dismiss the book publicly without having read it. I would feel obliged to read the book and make an intelligent criticism of it based on what I found in it myself. If I then wanted to decry the content for being morally offensive, the criticism would at least be based on knowledge and not conjecture." Valerie Wilson, Bristol.

I think the criticism is fair – I should not have relied on the advertising blurb or the instructions to tell me what the programs were actually like, but I haven't got time to try these programs out. However, the problem I have is that the views are now so polarised that it will be very difficult to get impartial reviews.

Even so, I'm actually not convinced that I am under any obligation (moral or otherwise) to review every unsolicited piece of software I am sent. My mistake was being too open. If I had just ignored the software and/or the unsolicited reviews, this controversy would not have blown up.

• **Multi-sync Monitors 1** – Having seen all three (Taxan, Eizo and NEC), admittedly not side by side but in adjacent rooms, I feel that the Taxan and the Eizo give the best displays and the Taxan marginally the better of the two. Mike Cook.

• **Multi-sync Monitors 2** – The Eizo 8060S, reviewed in February, has been replaced by the 9060S, higher spec, at the same price. In particular, it has the horizontal shift controls on the front which makes life easier when switching to the higher resolution modes. What else is better? Well it has higher horizontal scan rate (can't remember the figure) and now has "dynamic focussing" which is supposed to improve the focussing over the whole area of the screen. Certainly, the one I saw had noticeably better focussing in the corners than other monitors. More details from Eizo (UK) Ltd, Unit 7, Genesis Business Park, Sheerwater, Woking, GU21 5RW. (0483-757118)

NEC have launched a new Multi-sync of higher spec than the Multi-sync II, called the **Multi-sync 3D**, with a price only slightly higher than the M-S II (£675 as against £649). More details from NEC(UK) Ltd, 1 Victoria Road, London, W3 6UL (01-993-8111). Des Fry, Cheltenham.

(We will try to get hold of one to look at. Ed.)

• **What Price Hard Drives?** – The following was inspired by comments made by John Caulfield, (Archive 2.6, p14) about Watford Electronics' winchester drives – He begs the question "so why is it so much cheaper than the Acorn one?" It comes down to the type of drive supplied. As far as I can recall when I spoke to Mike Harrison at the MU show, he said that the drive supplied by Watford Electronics had an access time of 65ms. Scanning the current batch of computer mags, I note that 20 Mbyte drives with 65ms access can be purchased for as little as £160, which leaves £200 for the controller card. The Acorn winchester, by contrast, has an access time of just 28ms and these drives cost somewhat more. Typical price of a 20 Mbyte drive with 28ms access is £270 again leaving £230 for the controller card, but note that the Acorn controller can cater for two drives and the price includes the cost of fitting by a dealer. (All prices are ex VAT).

So what difference does the access time make?

Well, if all you are doing is storing programs, you would be hard pushed to notice anything but if you are storing random access files, you may notice a speed difference (but you would need both systems side by side to see this). So why did Acorn specify an access time of 28ms? The sad truth is that the Archimedes can suck data off even a 28ms Winchester faster than the drive can deliver it, so fast in fact that it has to idle while the Winchester catches up!! On the Acorn Unix workstation this idle time is put to good use – it actually has enough time to compress or uncompress the data it is transferring on the fly. This not only increases the storage capacity of the hard disc, but also increases the data transfer rate, leading to impressive savings in both disc space and transfer time.

However, the real reason for having a fast winchester was touched on briefly by Brian Cowan in his review of the Operating System Book (2.6 p45). This highlighted the ability of the MEMC chip to access Virtual Memory. The technique allows for a chunk, or even the whole, of a Winchester's storage to be mapped as though it were part of the Archimedes main memory map (up to 32 Mbytes). The difference is quite transparent to the machine and the user except for the speed of access, so when a Virtual Memory Module becomes available, you really will see the importance of access times! Current DRAM access times are about 200ns, so 28ms is snail-like by comparison but 68ms is more than twice as slow as that!

So you pay your money and take your choice. My personal preference is for the Computerware Winchester and controller. The 20 Mbyte drive has an access time of 40ms and the controller will support two drives. (There are separate connectors for the second drive are on the back-plate so there is no need to daisy-chain the cables.) At just £390 inclusive of VAT and carriage through Archive, this offers really good value for money. John Eden.

Yes, we would recommend the Computerware drives too. The only problem is that we can't get enough of them! This is because they are proving so popular that Computerware have been taken a bit by surprise. They are hoping to step up production to meet the demand, so if you want one, send a

cheque which we will put it in the queue. We will, of course, not cash your cheque until after the goods have been sent. Ed.

• **The Strength of Wimp Chess** – One of the discs that David Pilling is supplying is Wimp Chess. Given the available raw processing power of the Archimedes, you might expect something in terms of playing strength. I have experience with quit a few chess programs, so the fastest way of having some idea of the playing strength of Wimp Chess is letting it play against some of these programs. In all cases, I selected 60 moves in 30 minutes and thinking in the opponent's time, giving an acceptably fast response.

The first game was a let down, Psion chess on a XT IBM-compatible (the real thing, not under an emulator) was clearly too strong, and defeated Wimp Chess. This is not a surprising; Psion Chess plays a very strong game indeed. Only on some of the low levels am I able to beat it myself (occasionally). The two played a high level game, only in the end-game did the, gradually developed, better position of Psion Chess come into effect. Wimp chess had a VERY creative solution to this, it simply removed Psion's queen! In this case it was rather funny, but I most definitely won't like this when I am the opponent! Taking back the last moves restored the correct position.

The game against the old Acornsoft Chess on the humble Electron was a real laugh; Acornsoft Chess simply plays a very bad game. The best chess program on the Electron and BBC was (and still is) Colossus Chess 4. Wimp chess managed to sacrifice a knight for a rook and a slightly better position. The end game lasted endlessly, with no changes in the positions. In my opinion, both parties had the chance at several occasions to win the game. When I switched both programs to computer vs computer mode, they both came up with a defeat for white (originally Wimp chess).

So, I think that you can conclude from these matches that Wimp chess plays a good game, but not excellent. In the few serious games I played, I well.. uh.. always lost. But this is the right situation, there is no fun in constantly beating a chess program. I have the feeling I can beat it, I lose mostly because of blunders on my side, not because of the brilliant play of Wimp chess.

I have some reservations about the presentation of Wimp Chess. The pieces are adequate but could be better and I didn't like the board squares. There is no indication of the last move(s) done, the number of moves done, the time left for the player not to play and the square letters and numbers. The hint and strength options didn't work on my version and there is no evaluation indication of the positions. All these are fairly standard on commercial chess programs. I did like the save-setup option and the opening book. (Is it extendable?)

To conclude, it is a good program and plays a good game, but it is surely not the definitive chess program. When Colossus Chess X makes it to the Archimedes (already out on the Atari ST) I will go for that one. However on the disc there is also a version that should work under RISC-OS. I think I will really enjoy playing Lander while the Archimedes is thinking about its next move! Peter van der Ploeg, Holland.

• **Error trapping** – May I make a suggestion to writers of programs that trap the Escape key and do not exit (e.g. return to a command prompt)? If there are problems with the error handler or command loop, the user may get stuck in a continuous error loop with no way of exiting other than <ctrl-break> or <reset>. By testing for the break key (which normally has the same effect as escape) in the error handler, the program can exit if this key was used but carry on if the interrupt was caused by <escape>. For example:

```
ON ERROR PROChandle_error : GOTO
    prompt
```

```
DEF PROChandle_error
REM Error 17 is "Escape"
REM Inkey -45 is Break
IF ERR=17 THEN
IF INKEY(-45) THEN
PRINT "You pressed Break"
STOP
ELSE
PRINT "Escape"
ENDIF
ELSE
PRINT "Another error: ";REPORT$
ENDIF
ENDPROC
```

Jonathan Marten

• **Corruption** – this is the best adventure I've played (by Rainbird/Magnetic Scrolls). It comes in excellent packaging including a disc, tape (needed for the game, although you can send off for a script). You also get a a filofax insert that gives help, instructions and information for the game. When you boot the disc up, you get a mode 15 picture that even puts most ProArtisan screens to shame. If you could get hold of Duncan Maclean who helped do it then I and probably other readers interested in graphics would be very keen to find out how it was done. Almost every adjacent colour is different, but doesn't look digitised! If other readers want to save this picture then follow these instructions.

MODE 15

VDU 21(Switch the VDU driver off – i.e. don't print text)

*Game (Run Corruption)

Wait until the picture and music has loaded, then remove the disc

Press <space> (Tell program to load game)

A 'drive empty' error will occur, but will not be printed over the screen.

Insert new disc (i.e. to save picture on)

*mount (Anything you type will be invisible so be careful)

*screensave CORRUPT (Save picture as CORRUPT)

*BASIC(Go from Arthur to BASIC)

VDU 6 Enable VDU drivers

Music

The music I mentioned is also brilliant and probably the best I've heard on the Archimedes. It is also a complete song lasting several minutes written for the game, the tape also contains a professional version of the song.

The game

The actual game is also a very high standard, with dozens of good pictures (with nice scrolling). There are plenty of options for text and graphics etc, all controlled by the mouse. The adventure itself has been given a new angle i.e. the City with its wheeling and dealing. This is a welcome change from swords and trolls. The descriptions and locations are very detailed with a comment on

almost everything. A good sense of humour is included throughout the game and the vocabulary is very wide. You can interact with people to a certain level and follow them around and quiz them on many topics. The play is good, allowing a beginner to get started before the problems become more

complex. A set of coded hints are supplied, but unfortunately I am a present stuck, although I can give hints up to a certain level.

This game shows exactly how it should be done and I give it 10 out of 10. Philip Armstrong **A**

Credit where it's due

Here's a new section for Archive. I thought it would be a good encouragement to software and hardware suppliers to know that some of them (!) are doing a good job and are very much appreciated. So send us your comments about companies you think have given you good service, or products that you think are particularly good. I know this is open to possible abuse by unscrupulous suppliers who could write in as, say, Fred Blogs and tell us how wonderful their company is, but I believe that the "truth will out", so they won't fool us for long!

• **Oak PDT** – After Richard Fallas' comments last month about Oak PDT, he rang into the office to tell us that Oak had been most helpful and constructive and had accepted most of his suggestions/criticisms and were incorporating them into their software. **A**

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RISC-OS is here!

Tim Saxton

After waiting impatiently for some 6 months and reading all the magazine preliminary reports of the wonders of the new RISC-OS environment – here it is, in my hot, sticky hands – the finished product!

About the review

Firstly some necessary caveats about this review. As the last issue of Archive went to press, Paul received this first 'proper' copy of RISC-OS for review and he passed it on to me, with a request to have something ready for the next issue. This was only some two weeks ago. Since then I have spent as long as possible using RISC-OS and the supplied programs in various machines to get a general 'feel' for it. It is a very substantial package and a review of this size cannot begin to do justice to all the facilities supplied. There are some parts I haven't tried at all and other parts that have had a rather cursory examination and there are bound to be bugs and 'features' that I've missed, but I hope that what follows gives in some detail, features of the Archimedes in its new guise. So enough of the excuses and on with the review.

What do you get?

Basically, the upgrade is in 4 parts:

- Four new ROMs, with full fitting instructions.
- Two applications discs (App1 and App2)
- New Welcome and User Guides
- A support disc

Fitting the upgrade

To gain access to fit the ROMs requires the removal of the computer cover, and unscrewing the backplane (if fitted). Then the old ROMs are carefully extracted using a suitable screwdriver or IC extractor. Fitting the new ones (right way round, right end of the socket and no bent pins – check this at least three times!) is not too easy, but the process is identical to upgrading to Arthur 1.2, so if you managed that, you'll be OK with this upgrade. The fitting instructions are quite adequate for anyone familiar with the inside of a computer, but if you aren't, then Acorn dealers will be happy to fit the ROMs for you, but the leaflet points out that they may charge for this.

Initial impressions of the Desktop

There are now various options for the power-on reset, selected by holding down keys other than <R> and it now only has to be done once for standard monitors. A display quite similar to the old windows appears, but with less garish colours than before, and now you can select the form of window 'dragging' to be used – you can have the usual dotted outline drag or chose to drag the whole window with its contents.

Popping in an application disc and clicking on the new style disc icon on the icon bar at the bottom of the screen caused a lot of disc activity, but eventually a window with the top directory contents appeared. (The length of time this initial disc searching took depended on the number of 'application directories' on the disc.)

The style of this contents list can be changed from tiny icons and a name, to large icons or to a full description of each entry. Also, the order of display can now be selected, alphabetical, by file type, file length, or date. (*Somebody at Acorn has been looking at the Apple Mac! Ed.*) Many of the entries on the application discs begin with '!' and they are usually the 'application directories' referred to above. These contain all the programs relating to a particular application (First Word, Draw, Logistix, etc) and double clicking on them does not open the directory in a window, but starts up the application instead. (You can open an application directory in the conventional way by holding down <shift> and double clicking.) This new facility makes for much tidier file arrangement than before. Also a new type of file, the 'obey' file, which is similar to an 'exec' file but isn't displayed on the screen, making the start-up instructions invisible to the user.

Disc handling

How discs are handled is now quite different. RISC-OS makes extensive use of the name of the disc and remembers details of up to 8 discs that you have been using. If the wanted file isn't on a disc in a drive when it is needed, you are asked to put in the named disc and click on an 'OK' box when you've done it. (*Somebody at Acorn has been looking at the Apple*

Mac! Ed.) It is now essential to use the 'namedisc' function, and also writing what you have called a disc on its label saves a lot of frustration! All the filing systems – FloppyDisc, HardDisc, RamDisc and Network have a very unified interface to the user and copying files or directories between systems is very easy and is similar to the old desktop under Arthur.

Clicking the menu button on a disc icon allows some basic disc operations like format, verify, dismount, etc. to be selected from a menu. For a format, the final – "are you sure?" – "Yes" is now given by a mouse click and there are 3 format variants – the new 'E' option being the preferred type if the files aren't to be used with Arthur 1.2 – which gives an error on trying to read an 'E' disc. A configurable amount of RAM is used for data buffering and keeping directory information, so disc access can be kept to a minimum. The new format is much faster (factor of two) for random access files and more robust too as it keeps two copies of the root directory. Also, if you use E format, *compact is a thing of the past, since the files are now fragmented as necessary to use the available spaces on the disc.

Multiple mode windows

A palette icon on the icon bar lets you adjust individual colours and also allows changes between modes. Almost any mode may now be selected for use by the desktop, and icons, colours and text are re-defined to cope best with what is available in the selected mode. There is some pretty clever stuff going on here, with characters being redefined and shading used as appropriate. Even in mode 2 (20 characters per line, in theory) you can still read the file names and recognise the icons at the same size as the 80 characters per line of the default mode 12!

Three of the screen modes, 16, 17 and 24 have graphics horizontal resolutions of 1056 and graphically are treated as extended 640 resolution screens. This means that circles are squashed up to tall ellipses, but I found the modes very useful when I had a lot of large windows open that I wanted to get to without having to move things about all the time. Surprisingly, these 132 characters per line modes are quite readable using the standard Archimedes colour monitor. One of them, mode 24, which is 256

colours, 1056 x 256, uses 264k of RAM. It is obviously stretching the memory bandwidth towards its limit, as there is a rather disturbing blanking of the screen whenever the floppy disc is accessed. This doesn't happen with a hard disc or the network. The manual warns you about it, and says that one of the other new IBM VGA monitor compatible modes, (mode 28, 256 colours, 640 x 480) also does it.

Other differences

Another visible difference with the windows structure is in the way the right hand vertical slider length is worked out. The length is now proportional to the number of characters on the screen, not the number of lines, so as you scroll through text the length of the bar can change quite a lot, depending on the current screen contents.

The icon bar at the bottom of the screen can actually be longer than the screen and with lots of drives and file-servers and other bits and pieces installed, icons disappear off the end. Don't worry, just slide the pointer along the bar, and the missing icons scroll into view as you get to the end. Storage and output devices (discs, file-servers, printer drivers) tend to be at the left of the bar, with system application programs to the right.

Installing applications

Installing an application couldn't be easier, just double click on the appropriate icon in a directory viewer and, after a while, the icon will appear on the icon bar. If you would like a real-time clock display on the icon bar, just double click on the !Alarm application and, after some activity, it will appear. Sensible use is made of the numerous filetypes now specified – if you double click on a file that needs a particular application to be used, then automatically, the appropriate application is loaded, started up and the file is loaded into it. You can often tell what application a file is intended to be used with by its icon which is similar to its application icon, but is surrounded by a black border.

One megabyte, not enough?!?!?

On a 310, it is quite easy to run out of memory – all the applications provided use fairly serious amounts of RAM and you need to keep control of where your memory is allocated and remove

unwanted applications in order to give others enough room to start up. A 440 on the other hand can handle any reasonable number of the given applications without that problem and is a joy to use with the desktop. I guess that a 305 would be in real trouble trying to run more than one of the supplied desktop applications at a time and would need to be given its extra half Mbyte of ram to perform adequately. (*Now in stock!! Ed.*)

Memory control in the windows environment is now quite elegant and the tiresome *configure followed by a hard break is no longer necessary. On power-up, memory is allocated as determined by the configuration bytes in the battery-backed RAM, much as before, except you can now specify quantities in kbytes which makes it machine independent. However, memory may now be re-allocated as necessary to various uses, e.g. sprites, screens, fonts, etc, from within the desktop environment. It is done by clicking the menu button while pointing at the Task Manager's icon on the icon bar, which is a big Archimedes 'A'. This allows selections from the Task Manager's menu to be chosen, one of which is called 'Task Display'. A window now pops up giving a full graphical and numerical breakdown of the way the machine memory is currently allocated. Some allocations, shown by a red slider, can be adjusted up and sometimes down to redistribute memory to suit the application you wish to run. Others, in green, cannot be altered. For instance, if you wanted to use the 'draw' application with text, then it would be a good idea to allocate 100k or so for fonts, or the screen refreshing will be slow, and the disc drive will do a lot of thrashing. This is easily achieved by 'dragging' the slider up to the required length.

A criticism here – I think it would be better for applications to allocate themselves the amount of memory for fonts, sprites, etc they sensibly need before they start up. This is because it is quite possible to run an application with an inappropriately small allocation, then start an operation which proceeds at a painfully slow rate, and you can't correct the allocation until the operation has run its course. (I have just found, hidden away on the support disc in the IPC.GenBoot directory a module called MemAlloc

which seems to be what is needed – RMload it and do *help memalloc to see what it can do – I can't find any reference to it in the book and presumably only PCemulate uses it.)

The Ram File System

One of the sliders in the Task Display window is RamFS. This allows you to designate a quantity of memory to behave as a RAM filing system, with directories and files as on a disc. It has the advantage of very rapid access and I found it useful for keeping shorter utilities instantly runnable without changing discs, when used on a machine with only one disc drive.

TinyDirs

TinyDirs is another utility that can sensibly be described here. It allows you to install directories or applications on the icon bar for instant access when their directory viewer is not visible. Clicking on an icon installed via TinyDirs either opens a directory viewer or loads and starts the application.

Operating system access

It is also possible to access the command line from the Task Manager's menu. (alternatively, key f12 does this from almost anywhere in the desktop) and 'exit' stops the desktop environment and drops you back to the OS with a clear screen.

Lightning speed

Everything in RISC-OS and the Desktop happens at the lightning fast speeds we have come to expect from the Archimedes, but if you want the absolute maximum speed then the official way is to use the new command *RMfaster <modulename>. This copies the named module from ROM, which works at 4 MHz, to RAM, which works at the full 8 MHz. Of course, each module transferred in this way uses up some RAM. An obvious candidate for this treatment is BASIC, and the speed increase over the ROM copy is very similar to that obtained by using the disc-based BASIC supplied with Arthur. For those of you who like living dangerously, the Archive program that sets the machine's ROMs themselves to work at 8 MHz seemed to perform perfectly with my set of cool running Fujitsu ROMs and then nearly everything went about 20% faster!

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The Application Discs

The two main application discs contain some very competent utilities for, and demonstrations of, RISC-OS. I only have space to describe the main ones, !Edit, !Draw and !Paint. In fact these three, together with the new clever printer drivers, make up a simple Desk Top Publishing package.

File loading is done in a similar fashion for all three, either double clicking on an appropriate file icon, as previously described, or, if the application is already installed, the file can be 'dragged' onto its icon in the icon bar or into an already open application window. The file saving procedure is also common and is done from the 'menu' button window by sliding along the save option to a window containing a default name for a new file or the existing name, together with an icon representing the file type. Dragging this icon into the target directory window sets the filepath appropriately and saves the file.

Printing can be similarly achieved by dragging the file icon over an installed printer icon.

Text editor – Edit

This application allows you to edit text files in a similar fashion to Twin. It isn't a word processor, but you can quickly and easily build and manipulate text for Exec or Obey files or to use with Draw. As you type, words get broken over lines in a rather untidy fashion. The only automatic formatting available is retrospectively to insert new lines to correspond with word ends appropriate to the line length selected. Several windows may be open onto the one text file, which facilitates copying between different parts of a long document. Blocks of text may be marked and manipulated – here you can even triple click to select a line of text! (*À la Mac. Ed.*) Search and replace are fairly comprehensive and it is possible to insert text from a disc file into the current file and save the whole or part of the text.

The 'Task Window'

An important part of !Edit is the 'Task window' which allows you to set up a window in which you can run pretty well what you want – but no graphics or fancy cursor control. Anything running in this window only has access to a configurable amount of memory called a WimpSlot. A task window is

activated via a menu selected when over the edit icon on the bottom icon bar. Once in a task window, BASIC may be started up and a program loaded and run or a compiler can be set going.

I had some problems running the C compiler (release two) in a task window on a 310 with other applications installed. Sometimes it complained it didn't have enough memory, but occasionally the whole system crashed and had to be reset. Whether this was a problem with the compiler or RISC-OS I don't know. In fact, every time I crashed the machine (which was perhaps six times in the period of this review) it always seemed to be because there wasn't room to do what I wanted and this was not adequately coped with.

Running BASIC in a task window is rather interesting. The multi-tasking arrangement in RISC-OS is described as 'co-operative' – i.e. your program must pass back control of the machine via a Wimp call on a regular basis to let other programs have their turn. Running BASIC in a task window is NOT like this at all. I made up a distinctly non-cooperative program (just a REPEAT... UNTIL 0 loop), set it running, and lo and behold, I could still do anything else I wanted in the windows environment. There must be some sort of time slicing going on. Everything noticeably slows down when running in this mode.

The manual says that Edit is also suitable for editing BASIC programs, but the section describing how to do it is missing. Loading a BASIC file directly into Edit doesn't work, of course, as the program is stored with tokens for all the BASIC key words. Acorn say that the way to edit BASIC programs is as follows – use Edit to create a text file of your BASIC program, with no line numbers, and save it. (That's the way to stop everyone using GOTO's!) Now, using the f12 key to access the OS, *settype this file to &FFB – i.e. a BASIC file. Go back to the desktop by pressing <return> on its own. Now, if you double click on the file, it will load, start up BASIC, and run. Running BASIC programs this way appears to be as fast as running them in the non-desktop environment and, while the program is running, the desktop facilities cannot be accessed. When the program ends, you are asked to click the mouse or press space, and the desktop restarts

where it left off. In this mode, you can use graphics, change mode, etc. If the program locks up in a BASIC loop, or you want to quit, then the escape key will recover control as usual. The only thing I have found to beware of with this Edit facility is to be very sure to put a new line on the end of your text, or very unpredictable things can happen when you run the program.

Once you have changed the filetype of your text file, if you wish to edit it further, then reload this 'BASIC' text file into Edit, to tell it the new file type, or you will have to redo the *filetype operation when you resave the text. If you have an existing program that you wish to edit using this facility, Then you will have to load the program into BASIC in the usual way, set LISTO8 for no line numbers and list the program to a spool file. Then load this file into Edit and get rid of the extra newline characters (shown as [0d]) by replacing them with nothing. I think the Arthur1.2 BASIC editor (which is provided on disc with RISC-OS as a module) is better for editing BASIC programs but of course it won't work in the desktop environment. I guess it won't be long before someone produces a decent desktop compatible BASIC editor.

Sprite Editor – Paint

Paint is a pixel editor designed to be used with sprite files. It seems quite competent, with variable spray cans, brushes, pencils, etc. and many of the facilities of existing art packages. I used it to make a sprite file for the icon on my little multi-tasking BASIC program and it worked well; many of the operations being quite intuitive. You start off by defining a sprite file and then proceed to select and draw individual sprites in this file in separate windows. The size and colours may be defined for each sprite. A toolbox menu allows selection of any of the wide range of drawing and editing facilities.

Zooming is very flexible, the zoom ratio being selectable over a wide range of integer ratios. (e.g. 4:5 would enlarge the view by 25%) It is quite possible to have several windows open on different parts of the same sprite, at different magnifications if required. Changes made in one are immediately reflected in all of them.

Rotation and flipping may be performed and a pre-defined sprite may be used as a brush. An interest-

ing option, that I haven't seen before, is the ability to insert or remove columns and rows from the sprite. New ones are inserted in background colour, and the size and position of the alteration is controlled by the mouse. If a printer driver is installed, then a sprite may be printed directly, without previously saving it. Clicking on menu when over the Paint icon on the icon bar allows you to select 'Get screen area' – you can use this to select and capture any part of the visible screen and save it as a sprite. I imagine the illustrations in the new manuals may well have been captured with this facility.

Best of all – Draw

The jewel in the crown of the applications programs is Draw. This is an 'object-oriented' graphics editor which can be used to make line drawings by itself or it can use text and graphics from Edit and Paint or any other sprite or text generating program to make a complex drawing apparently extending over many screen areas.

'Object-oriented' means that a line, for instance, is not stored as a pattern of pixels, but as attributes, i.e. features, of the line – its length, shape, position, width, etc. Whenever you redraw the object on the screen, the program translates its attributes into the best representation of them it can achieve. So, zooming in on an object does not necessarily produce a 'lumpy' picture and, more importantly, printing out is now not necessarily limited to the resolution of the screen. Also, although you may have several objects shown on top of each other on the screen and, if they have been defined separately, you can move one without affecting the others. (You can also link objects together into groups so that moving one moves all, if you wish.)

Bezier curves are now implemented (by the OS I think, so probably accessible to BASIC) and this allows the freehand drawing of irregular shapes to be done 'smoothly'. Again, the position and shape of the object is not stored as a pixel pattern, but as 4 points; the start, the end and two control positions, which determine the shape of each part of the resulting curve. It is now easy for non-artists to produce professional looking curves.

Text can be either typed in as a single line, or imported as a text file into Draw, in any available font and split into as many columns as required.

Various control sequences at the start of the text file determine the style, etc, although certain aspects of the resultant object – column sizes for instance, can be subsequently altered within Draw. Moving columns around, making headlines, adding drawings and boxes are all remarkably easy. I did find however, that enlarging some of the fonts to a size suitable for a banner headline did result in a lumpy appearance and print out. I imagine it is necessary to use large fonts definitions (not supplied) to avoid this. Scaling, Rotation, Object editing, Exporting of text from columns – it's all there. To fully describe all the features of Draw that I've found so far would take much more space than is available and I've only been using it for a few days yet!

Printer Drivers

Complementing these three applications are the new printer drivers, PrinterDM for dot matrix printers and PrinterPS for postscript compatible laser printers. Installing one of these makes putting almost anything onto paper a much easier task than before. What follows, describes only my experience with the dot matrix driver, as I have no access to a Postscript laser printer, but the operations should be similar.

A range of printers and resolutions are selectable – mostly Epson FX and LQs with resolution on some to 360 x 360 d.p.i. Destinations can be set to serial port, parallel port, network or a file. This last enables all the output to be redirected to a file for you to print out at a later date. The speeds and data types for the serial link can also be adjusted here – incidentally the speed options have now been extended with 15 available between 50 and 19,200 baud.

To print something out – a draw file, text file or a sprite, simply drag the file icon from its directory viewer and drop it on the printer symbol on the bottom icon bar. The file will now be printed in as appropriate a way as possible. If it is a plain text file then text mode is selected on the printer and high speed output is given. If it is a sprite, then a dot image is produced, with shading for the colours. If it is a draw file, then things get really complicated. The printer works in an appropriate bit mode and for a sprite object, does a dump as before (scaling it as necessary), for a text object it uses anti-aliased fonts to the highest resolution it can, and for line objects

it also works to the highest resolution, calculating what dots to print from the line attributes. You do not just get a screen dump. The quality of output even from 9-pin printers is surprisingly high and the ability to print out to the resolution of the printer rather than the screen means the virtual end of those lumpy circles and jagged straight lines at acute angles to the axes.

Using these three major applications and the printer drivers does let you almost do “desk top publishing”. I would like to see the results when using a Postscript laser, but even using a 24 pin NEC P2200 it is certainly adequate for newsletters, etc, and if you have a Watford Video digitiser to use to input ‘photographs’ then providing you get the contrasts carefully adjusted, the results can be quite impressive (I found it quite easy to produce images that were too dark).

Help!!!

An application called ‘Help’ is also now provided. If the option is selected, a limited amount of helpful text pops up in a window as the pointer is moved over the screen. It doesn't seem to do much more than guide you around the basic window structures, and slows responses down noticeably. You might use it when you start using windows for the first time but not for long.

BBC emulation

The BBC model B emulator ‘65_Host’ is provided to give what appears to be a fairly accurate emulation of the old faithful – including screen pokes and sideways ROMs, but not sound. I haven't really investigated this, but I do know it runs Chuckie Egg!

Music, Maestro, please!

You also get ‘Maestro’, which seems identical (apart from colour) to the program provided on the old Welcome disc. This was the only program that caused any distress to the windows' updating. Having a small window open on top of some scrolling music meant there was just too much to do to keep up. The music played correctly, but the manuscript displays were very disjointed. Presumably, the memory bandwidth taken by the sound system just did not leave enough processor access for adequate window updating.

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Minor applications

There are several other minor applications supplied, but the 'fun' one for me is the Magnifier – written in BASIC. It allows you to move a circular magnifying glass over the screen to enlarge whatever it passes over. The degree of magnification is selectable and it works in all desktop modes. This one will really impress your friends!

RISC-OS on the network

Using the Archimedes on an Econet system is much easier with RISC-OS. The desktop provides facilities to see what file-servers are available and to log on to as many as you want. When loading or saving files, the network speed is still as limiting as ever, but you now have a little hourglass with a 'percentage complete' indication, which at least tells you the system is still alive. File compression is not implemented, unfortunately, so long files still take a long time.

There have been problems with 'Not listening' errors when using Filestores and I'm sorry to say they can still occur. (Once in loading 10,000 files – but that is once too many.) An electronic mail system is now provided which will be welcomed by many users. It was rather difficult to try it out with only one copy of RISC-OS available(!) but each user has an Inray file into which other users may write, using the mail facility in their machine. If you have mail waiting for you, the mailbox icon bulges, and if you 'collect' it, it is displayed in an Edit window as well as being appended to a mail log file you have set up.

The Support Disc

The support disc contains information from Acorn themselves and many other suppliers of software on how to convert existing software releases to run under RISC-OS. This usually takes the form of a text file, setting out the procedure to be followed, and then some update files to be used with it. Most popular releases are covered – all the Acorn range together with Clares, Colton and Minerva – as well as many others. The amount of information given by suppliers varies from not much more than an address for enquiries to a new module and replacement pages for the manual. (A full list of suppliers who have provided at least some

information is given in the RISC-OS Hints & Tips Section on page 31.)

Trying out updating First Word Plus and the PC emulator to run under RISC-OS worked without any trouble. Updating existing versions in this way doesn't allow multi-tasking but just starts the application correctly from the desktop and usually returns to it when the application finishes.

Missing from the suppliers giving information on this disc are Beebug and The Serial Port – so this means that the two popular comms packages aren't updated, and probably won't run under RISC-OS as they stand. (Beebug say that version 1.04 upwards of Hearsay will run and an updated version is available for £5 and, while not running from the desktop, *Unplugging InternationalKeyboard and using *ArcTerm (not !boot) gets ArcTerm going.)

The New Manuals

The small Welcome Guide of some 60 pages, won't contain much new to you unless you've avoided the desktop under Arthur. However, there are subtle improvements in the functioning of the mouse buttons, particularly regarding the scroll bars, so do read it.

The main User Guide is a different kettle of fish – 487 pages long and a comprehensive guide for the high level user of Windows, RISC-OS and the application programs provided. However, you won't find anything about multi-tasking BASIC programs under RISC-OS or any SYS calls. This book isn't merely a supplement for your existing User Guide, it replaces most of it entirely. (But don't throw the old one away – you still need it for the info on BASIC.) Acorn have obviously taken this approach as being the most economical and also one which ensures that users have a uniform level of documentation. It does mean, however, that Arthur users have to read a lot of details they already know about in order to find out about the new goodies.

My experience is that it is time well spent to read this book. Many of the 'problems' I encountered with RISC-OS go away with a fuller understanding of its working. (i.e. if all else fails read the instructions!)

I am disappointed that there is no advice on using BASIC with the new multi-tasking environment but

having struggled with Arthur windows using the PRM and not having achieved any real level of competence, I am not too surprised. The user interface is simply not at a high enough level for easy use.

However, all is not lost, as there are some multitasking BASIC programs on the Application discs and examining these shows what has to be done. One of the simple ones, the sliding block puzzle in application directory !puzzle, yields its secrets quite quickly and although I haven't much idea of what a lot of the SYS calls were doing, I was able in a fairly short while to alter this application to multitask my own trivial BASIC program to put in my window some pretty coloured squares at one second intervals. I think the concept of a standard library for use with multi-tasking BASIC, as suggested in last month's Archive, will be the way ahead. I believe Acorn should supply this library, as they understand the finer nuances of the system, but I suspect it will end up being done by someone else!

Conclusions

So what are my overall impressions of RISC-OS, does it live up to expectations? In a word, YES. There were one or two unexpected responses and a few ragged edges, mainly when trying to do things where there wasn't enough room, but in general it seems very competent and forgiving of finger trouble. The main drawbacks are that 1 Mbyte will quite quickly not be enough memory and that a hard disc or at least a second floppy are required to get maximum benefit. This first presents quite a problem for 310 users and the second means quite a lot more expense. However, let's not make too much of this memory limit; you can still have a couple of good applications running in a 310, with the printer driver installed too, but I couldn't make room for the full 'DTP' suite to be present at once.

Is there any benefit in upgrading?

Exactly what benefits RISC-OS gives you depends on your use of the machine.

PC emulator – At the bottom of the benefit scale, the PC emulator appears to run at exactly the same speed and with approximately the same amount of free RAM as before. The upgrade just allowing easy access from the desktop and making most memory

available with the new arrangements of RISC-OS. I wonder if there are plans to use the new VGA modes with the emulator?

BASIC – The main improvements in BASIC are a few extensions to the language (local DATA statements and an 'OVERLAY' facility, for instance), a 20% or so improvement in overall speed, a dramatic improvement in file random access performance if you use the new disc format, many more screen modes, flexible memory allocation and a RAM filing system. I have no doubt that there are multitudinous SYS call additions that will be of use too, but no details are provided.

On the negative side is the fact that the BASIC editor module now has to be loaded from disc and you will have to purchase the new BASIC manual or something which defines the new facilities. The sheer class of the new windows environment will make it worth the effort of learning to use them to give your programs that 'professional' feel.

Applications – If you use mainly applications in your machine, First Word Plus, etc, then the benefits will be faster operation, multitasking from most new applications and a very easy interface to disc and directory operations or any other lower level operation. You won't have to worry at all about directory structures or type in long pathnames. The supplied applications are very powerful in their own right and the printer support is now excellent. New applications will appear that will use the new facilities to the full giving a very usable interface to a very powerful machine. In other words, the benefits of RISC-OS in this environment are very significant.

Whither Archimedes?

I think Acorn are changing their perceived main user of the Archimedes. If you use the keyboard for anything other than word-processing then you are a 'specialist Archimedes user' and if you write programs, well, I don't know what you are! RISC-OS and the desktop are obviously being aimed at application packages, where a non-expert can quickly control this very powerful machine in a certain restricted environment. Nothing wrong with that – it will allow many more people access to this remarkable machine and should sell lots of

computers but I think I detect a shift in emphasis away from individual programmers.

Also, the future lies with machines with 2 or 4 Mbytes of memory and beyond. The 310 is the bottom of the range and, as such, cannot be expected to be able to fully exploit the new OS and facilities. Nevertheless, Acorn are to be congratulated on squeezing a quart into a 1 Mbyte pot and allowing facilities to run that would need much more memory on competing machines.

But is it worth it?

Whenever a new version of an operating system is released, there is reluctance on the part of software writers to take advantage of the new features because they then don't sell to those who don't

upgrade. (viz. BBC model B and the Master series – it is only recently that the use of the Master's sideways RAM has become widely used in commercial software.)

In my opinion, by making RISC-OS so cheap and so good and bundling powerful applications with it, Acorn should avoid that problem this time. Look at what you get for £36! It is the software bargain of the decade. Everyone should upgrade at once and software houses should now totally concentrate on RISC-OS, forgetting Arthur compatibility. There's going to be a period of slight confusion, where magazines such as Archive will have to provide advice and support to people with problems, but in six months time, I suspect no-one will even remember poor old Arthur! **A**

RISC-OS Hints & Tips

We begin a new section this month to help you get to grips with RISC-OS. When you buy RISC-OS, you get a disc full of information from software houses (see list below) about how to get their software running under RISC-OS, but I suspect that because RISC-OS is so new, there will be lots for us all to learn – hence this column. We really need a volunteer to be the editor of this corner – someone to whom I can send all the info and who will then collate it, check it and regurgitate it to me (preferably via Eureka II for speed). Anyway, Mike Harrison, Matthew Treagus, Keith Milner and Ting Kuei start us off.

- **Flashing screens** – I've just got hold of the release RISC-OS User Guide and noticed that it does not seem to mention the fact that in modes 21, 24 and 28, the screen blanks when accessing floppies, due to the high DMA rate. I'm sure many dealers will get calls from worried users who think that fitting RISC-OS has damaged their machine because of the screen flashing on and off!
- **Logistix** – Logistix users must replace the Floating Point Emulator in the Library of the Logistix Disc (version 2.50) with the later one which is supplied with RISC-OS, i.e. FPE version 2.60. It can also be found on the ABC Compiler Disc. If this is not done Logistix, will not run correctly.
- **TWIN** – If, like me, you are annoyed at the delay in loading TWIN when editing programs,

especially with BASIC using TWINO8, make an Obey file that does the following :

```
Set Run$Path Ram:,<Run$Path>
Copy Twin Ram:Twin f~c
```

(Ensure that your configured RamFS size is big enough first!). After running this, Twin will be instantly loaded from Ram Disk. You can of course also include in the file a *Key command to define your favourite function key to call Twin, e.g.

```
Key 1 |UTWINO8|M
```

For BASIC. The IU deletes any crud which may have been on the command line before you hit <f1>.

- **Viruses on RISC-OS!!!** – I wonder how many people will look at this in panic. Don't worry. There is a virus on RISC-OS, even before it is released, but it is totally harmless. In fact it is quite fun. First, a brief description of how most viruses work:

Most business machines load their operating system from disk. So, in order to 'virus' one of these machines, the offending program just becomes part of the operating system in some way. It copies itself onto other discs with operating systems on and soon every copy of the OS you have is "infected".

On a sensible computer, such as the Archimedes(!) the operating system is on ROM, and **cannot be altered!** Thus if someone decides to write a virus program, once it is detected, turning the machine off

will remove it. It is, however, possible to install a virus on other files on disc. This is much more difficult to do, is easier to detect and easier to remedy. For instance, the !BOOT file is a common file to be found on a disc, and a virus could conceivably attach onto this, although it would be very difficult since every !BOOT file is different.

I will not disclose how the RISC-OS virus installs itself as it will only encourage people to write viruses. I will say, however, that once detected, it is ((very simple)) to remove it with no after effects. If the virus (which actually originates from Acorn!) appears on your disc, not much actually happens... or at least it appears that way. You are using the desktop as normal and suddenly, a small fish appears on the screen and swims across, behind all the windows, leaving a trail of bubbles which rise to the top of the screen and disappear. Several more fish swim backwards and forwards on the desktop until the machine is reset. This virus is totally harmless, the only ill effect is to use up a bit of processor time! In fact, I have installed it deliberately as it is quite relaxing!

Another virus we have heard of is the FF8 virus which adds itself to filetype FF8 files. It displays a message and prevents the affected file from running on the 13th of the month. This it is a real pain if you are not careful, i.e. if you forget to turn the computer off before running a new program! There is a detector program available (downloadable from area 2 on Fureka II) but it will only check for the existence of the virus and will not destroy it.

• **Manuals** – Q: When RISC-OS is available, does it mean that the manuals I purchased are outdated or will Acorn publish a cheap edition to add to it?

A: The bulk of the PRM remains correct, however there is a wealth of brand new information and a new PRM will be out in due course, probably in three volumes!

The following firms have provided help on RISC-OS compatibility. The information is on the Support Disc that comes with RISC-OS.

Abacus Training Ltd
Ace Computing

Acorn Computers Ltd
AVP Computing
Cambridge Micro Systems Ltd
Clares Micro Supplies Ltd
Colton Software
Dabs Press
Dixon and Dixon
Emmerich (Berlon) Ltd
GEM Electronics
Intelligent Interfaces Ltd
Institute of Ophthalmologists
Lendac Data Systems Ltd
Lingenuity (Lindis International Ltd)
Magenta Research Ltd
Maze Technology
Meadow Computers
Minerva Systems Ltd
Mitre Software Ltd
Oak Professional Software Ltd
Silicon Vision Ltd
Watford Electronics Ltd

DIGIT

Image Analysis Software for measurement from video captured by the Watford Video Digitiser, or from photographs, drawings and maps traced with a high res digitiser tablet.

Count and measure length, width, area, perimeter, Feret diameters, C of G, shape factors etc.

Store, print and edit digitised outlines and measurements, and plot results as histograms with mean and standard deviation.

Disc, manual and lead for tablet: £150.

Also available: 3D reconstruction, 2D distribution and graph reading software.

Details from:

Dr. B. P. Hayes,
Institute of Ophthalmology,
Judd Street, London WC1H 9QS.
Tel. 01-387-9621 ext 224.

Making Printed Circuit Boards

Brian Cowan

A review of ARC-PCB: Printed Circuit Board Designer from Silicon Vision Ltd

Producing PCBs

I have always thought that designing printed circuit boards was one of those areas where the use of a computer would make life a lot easier. In the past I have made quite a few PCBs by one of the old manual methods and unless you are really experienced in planning layouts, you can waste quite a lot of time. The most important items of equipment for such a task are a soft pencil, a good eraser and plenty of paper!

The usual procedure consists in placing a few IC packages – that is, drawing their pads, and then running in tracks as required one by one and placing the discrete components: resistors, diodes, capacitors and transistors. If all goes well you can then add a few more IC pads and continue. The trouble is, you invariably find that you need some more space somewhere, which involves shifting some of the already placed pads and tracks. Thus the need for an eraser – and patience.

That's the design side sorted out. The professional's next step is to prepare a double-sized transparency of the required layout using adhesive tape and pads. One side of the board is done in red and the other in blue so that using photographic separation/reduction single-sized masks of each side may be produced. On the other hand, the amateur will probably draw the required layout directly onto the copper-clad board using an etch resist pen.

Other systems

In my place of work we have been using a number of computer based PCB systems for some time. For administrative reasons, these are based on IBM PC clone machines. I have, in the past, tried these out and rejected them all for my own use for a variety of reasons. I certainly don't want to have to read a thousand page manual before producing a circuit board; it is my contention that any computer application should be sufficiently user-friendly that you could "switch on and go" with the minimum of preparation. Software should be written in a logical and intuitive manner. Other objections to these

packages concern the complexity of using various of the facilities and the difficulties involved in producing the final printed circuit boards without sophisticated equipment.

System requirements

You may not be surprised to learn that I had been thinking on and off about writing my own PCB package – of course, using an Archimedes, for which it is ideally suited. Fundamentally, what such a package must do is to draw pictures consisting mainly of lines. Now there are essentially two ways of encoding such a design. Either it is stored as a bit-mapped object (a sprite) or, alternatively, the picture is represented in a more abstract way in terms of the coordinates of the end points of each straight line segment together with information about its thickness etc. The advantage of this latter approach is that the end product will have an accuracy limited only by the printer or plotter used. It also means that you can zoom in on any area while creating the design. The only problem is that writing such software (as Silicon Vision have done) is much more involved.

ARC-PCB

I was delighted to discover that Silicon Vision had produced a PCB system for the Archimedes. The specification on paper seemed impressive so I was eager to try it out for real. Opening the box I found a single disc and a slim manual of thirty one pages. I was impatient to get going so I inserted the disc in my Archimedes and pressed <shift-break>; it booted up perfectly. Before me was a screen display with a large cross-wire cursor. Down the right hand side was a list of options, some of which I will describe later. It was all plain sailing; in ten minutes I had produced a double-sided design and I had not even looked at the manual. That's what I call User-Friendly software.

A first look

I spent quite some time investigating the facilities of this package even including reading the manual! You can run ARC-PCB on any model Archimedes from a 305 to a 440 using either Arthur or RISC-OS, and both standard and multi-synch monitors are supported. Using a 305 machine a design may

include some 10,000 items, and this increases to 300,000 on a 440! One expects fast graphics response from a RISC based machine, and from the ARM chip set in particular. Conventional PCB design systems are, by their nature, somewhat slow in display and it is in this area that ARC-PCB leaves the others standing; the zoom, pan and redraw operations are essentially instantaneous.

Latest release

After my preliminary investigations, although quite impressed, I had assembled a list of complaints and general gripes and a few desired but absent features. Fortunately, I then met one of the directors of Silicon Vision at an exhibition and I outlined these points to him. I was quite taken aback by his reply: the latest release of ARC-PCB solved all the problems and provided all the extra features I had enunciated! And he gave me a demonstration to prove it. A few days later a new disc appeared on my doormat. Accordingly all discussion will relate to this latest release, ARC-PCB version 1.5. Let's look at what it can do.

Multiple layers

You have the facility for designing up to eight layers all in one go. This is not quite as silly as it may seem, even for those of us who don't have the facility for multi-layer boards. The layers are not necessarily all part of the circuit. As well as the two sides of a PCB, you can produce a pattern for silk-screening component positions onto the board, or simply layout guides to be printed on paper. As well as lines and boxes to locate components you can incorporate text which can be printed in a range of sizes and in reverse if required. The boards can be up to a staggering 32 inches square.

On the screen, each layer is indicated in a different colour and you can choose which layers are currently displayed – the fewer layers the faster the screen update. Layer zero is a special "layer" as its figures come out on all other layers. This is used mainly for pads for through-board mounting components and wherever holes go through the board. You can choose the size of the pads to be from 0.010 inch to 0.255 inch, and the track width from 0.001 inch to 0.255 inch. According to the magnification scale chosen, lines may be displayed at their appropriate width or not; there is a zoom range of 1:1 to 144:1.

Placing pads

As discussed above, the first thing one would want to do is to place pads for a few ICs. You can select a grid interval of between 0.001 inch to one inch. Choosing 0.1 inch will align all IC packages. There is an extensive choice of pad layouts provided. Standard DIL pinouts of up to 64 pins are available at the top right hand side of the screen. You click the mouse with the cursor over the required number and then move the outline box to the required position before clicking again. One button will place the pads vertically and another button will place it horizontally. This is much easier than it seems; at each stage of an operation a status line at the bottom of the screen indicates what each button of the mouse will do.

Library layouts

If you don't want DIL pads then the library holds a whole host of other arrangements. Clicking the cursor over LIB on the right hand side of the screen brings up a display of the library's contents in a hierarchical fashion. There are multi-pin IC pads, and various other connector pinouts. Also there are pad layouts suitable for resistors, capacitors etc. The library works in an entirely logical manner allowing you to go up and down the directory tree at will.

Routing tracks

Having placed some pads (and you have the choice of surface mount pads as well) you will want to make interconnections with tracks. You indicate which layer you want by typing its number and then you can run the tracks. There is the choice of doing this manually or automatically. For manual placing, you click on LINE (on the right hand side of the screen). Then the next click indicates the start of a line and the subsequent click its end. For auto-routing you first select the "rat's nest" option by clicking on RAT. Then by clicking the mouse you make all the required connections which at this stage are displayed as (possibly intersecting) straight lines. The maximum number of such lines is limited solely by the machine's memory. When these are all done you then click on LEE or PATTERN. These are two different path-searching algorithms; LEE being the more efficient algorithm for finding long tortuous paths (within a five inch square search area) and PATTERN being a sophisticated pattern recognition router suitable for

bus connections of memory arrays and other regular placements. Practice is needed in choosing the best one for a particular application.

Useful features

The package really demonstrates its utility when you want to do some modifications. You can move a whole area while still preserving connections. Having selected a rectangular area, when it is shifted, all tracks crossing the border become "rubber banded" and remain so until subsequently routed. It is thus remarkably easy to move areas, copy areas, and even rotate them. Similarly it is easy to save areas to the library for use in future designs.

There are some very special features of ARC-PCB which indicate the attention which Silicon vision have paid to user feedback. In particular I must mention the 'cleanup' feature. When you run tracks between pads they must start and end on the middle of the pad. So although the pads start life having a hole in their middle, this can become partially filled. Running cleanup after a design is completed clears the holes in the centres of the pads. This is a vitally useful feature for those people who have to drill out their boards without the benefit of an automated drilling system, since the drill bit sits nicely in the etched dimple in the centre of the pad. This is the only PCB system I have seen with this facility (certainly the only one costing hundreds rather than thousands of pounds) and therefore, to my knowledge, the only such system suitable for hand preparation of boards. On the other hand, for users with access to programmable drilling systems, ARC-PCB can create a file of hole coordinates for export so that the entire process may be automated. As yet I have not tried this facility out, but I hope to use one of these files to drive a CNC milling machine.

Help and documentation

There is an on-line help facility, although I have not needed to use this very often. For more information you can refer to the manual. Now I said this was quite slim, but it is extremely well-presented. Almost all you want to know is there, and in the logical place. What I want in a manual is everything easy to find without having to wade through page after page. This is just such a manual. There is much useful up-to-date information in the readme files on the disc. There are all of fourteen readme files which outline the various improvements in the later

releases of the system. I assume that at some later date, a new manual will be produced incorporating this information. However, with Silicon Vision's policy of continuous upgrading of their products, this becomes difficult. I suppose one solution would be to dispense with the manual altogether and supply it solely on the disc.

Printing

When it comes to printing out the masks, you have a choice of scales of 1x, 2x, 4x and 8x, and you can print either on a printer or on a plotter. Plotter drivers include HP-GL (which I used), Plotmate and Graphtec, although not Gerber. In practice, this is no problem since the photo-plotters using the Gerber system generally also provide HP-GL emulation. Also, there are printer drivers for both 9-pin and 24-pin printers. A very welcome feature is the facility to apply a scale correction, mainly for plotters which are incorrectly calibrated. This is another of those features which although small, can make life so much easier for some people. It is not actually necessary to plot/print out the masks; a plot file may be created for later use. Alternatively, there are companies which will produce completed boards from such files.

Conclusion

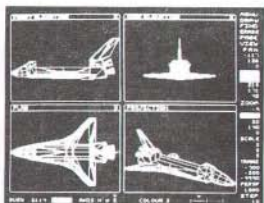
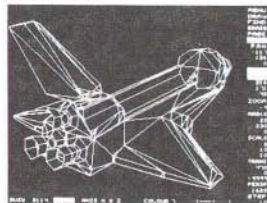
There are many other features of this package although I can't go into them all here. In summary, I am delighted with ARC-PCB. It is better than any other system I have seen, as well as being easier to use. This is particularly relevant to the amateur who processes boards by hand – the cleanup facility and the ability to apply scale corrections are invaluable, as is the possibility of using an ordinary printer. For what you get, the retail price represents remarkably good value – this is a superbly produced piece of software. For an extra £75 you get all software upgrades for a year, while for £100 Silicon Vision offer a telephone hotline service. Complete turnkey systems are also available. In conclusion then, I strongly recommend ARC-PCB to amateurs and particularly to semi-professionals and professionals. If my college's electronics laboratory used Archimedes machines, we would certainly be using ARC-PCB.

ARC-PCB £195 from Silicon Vision Ltd (£170 through Archive). **A**

SILICON VISION

SOFTWARE FOR THE ARCHIMEDES & BBC

SolidCAD



The ultimate 3D draughting system for Architectural design, Interior design, Engineering Design and Teaching CDT. Allows drawing in plan, front & side elevations and also directly on flyviews. Includes powerful zoom & pan options for precision draughting and surface definition for creating solid pictorial objects. Also includes Sweep, Extrude & Macro facilities for designing very complex objects easily. Designs created with SolidCAD are compatible with the Realtime Graphics Language for high-speed flicker-free animation. The colour Archimedes version also performs smooth shading for realism.

Archimedes users can upgrade to the Realtime Solids Modeller (Arc) for £40.00.

£49.95 (ARC & BBC) New

REALTIME SOLIDS MODELLER

The new Archimedes series both the sophisticated design environment of SolidCAD and the high-speed animation capability of a Realtime Graphics Language (RGL) module developed in pure ARM Risc code for supercharged performance. The package is ideal for Architectural design, Interior design, Engineering design & teaching CDT. The RGL facilities for wireframe to create standard free animation of designs from your own graphics. Smooth shading is also performed for realistic images. Through out in house developed in 3D design and high-speed techniques, no other package can rival the design environment & animation speed of the Realtime Solids Modeller.

£89.95 (ARC) New

REALTIME GRAPHICS LANGUAGE

The Realtime Graphics Language now provides a complete 3D Solids, Wireframe & Screen graphics with 3D edit commands and 3D Editors for designing objects to animate in the real-time graphics. Includes a 3D, 000 points/sec line generator for fast 3D drawing of planes, cylinders, cones, spheres, boxes, perspective and orthographic. Also compatible with the graphics routines of SolidCAD (BBC).

£49.95 (BBC)

SUPER-DUMP

The graphics printer driver which takes advantage of the highest resolution capability of currently existing animation systems to provide 1920 x 1024 resolution images can also be used as a high-resolution printer driver before printing. Fully compatible with SolidCAD, Realtime Graphics Language, Guide Array design system & 3D CAD Animation system. Real-time animation capabilities of other CAD packages can be made compatible with Super-Dump using the provided a few simple commands. An example program is included in the package.

£15.95 (BBC), £24.95 (ARC) New

Presentation Manager

The Presentation Manager is a user-friendly environment to create, edit and play back computer presentations. It can be used to create a presentation, edit it, and then play it back. Also handles graph plotting for presentations. Presentation Manager can be incorporated within the presentation software.

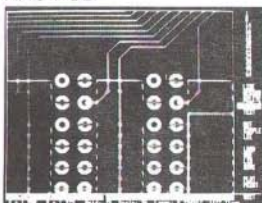
£34.95 (BBC), £49.95 (ARC) New

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All prices include VAT and Carriage (Overseas orders add £4).

ARC-PCB



The ultimate PCB design system developed specifically for the Archimedes with a specification that cannot be matched. Includes Automatic routing, Rats nesting, 8 layers, Surface mount capability 0.001 resolution, 32 x 32 maximum board size, On-line Help, Fast Zoom/Pan/Redraw, Text & Sidesheet facility, Variable Line Pad, Text Grid & Drill Path Libraries, Block Move Copy Rotate Mirror/Erase options, and up to 100,000 components. For hardcopy, the system supports a large number of plotters and ordinary Epson compatible dot-matrix & high resolutions (1920 x 1024) of 240 dots/inch for near laser quality output. An entry-level ARC PCB system (without auto-routing) is available for 199.95. Auto-routing upgrade: £100. Enquire about our turnkey PCB design systems complete with Colour Archimedes and/or plotters with prices from £120 to £1,000 inc. VAT.

£195.00 (ARC) New

RiscBASIC

Supercharge your Archimedes-Basic programs by compiling them automatically into pure ARM Risc code with the RiscBASIC compiler. Features include relocatable modules, Cross reference of all variables, functions, and procedures, Floating point and Integer support, Stand alone code generator, Optimising compiler & Full source code handler.

£99.95 (ARC) New

RiscFORTH

A new 32-bit implementation of the FORTH-83 standard designed to take full advantage of the ARM architecture. Features include Multi-tasking, Optimising compiler, built-in ARM assembler with floating point memory, built-in Full-screen Editor, File system interface, OS calls support, Floating point & Integer maths, WIMP support, Single-step debugger, Shadow screen for documentation, Block manipulation, Dictionary & Vocabulary display, Code listing and a standard code generator.

£99.95 (ARC) New

Language Forum

David Wild

As I promised last month, we have a mixed bag again this time – some hints on using Twin, something on APL, something on Ada, some thoughts of mine on BASIC and one or two minor hints on Pascal.

Twin

Peter Linstead of Dunstable has sent in a hint concerning the use of function keys in Twin, to keep down some of the work involved in typing the relevant commands. This may sometimes seem like laziness – all programmers like spending a great deal of effort to cut down on typing – but it can have the considerable advantage of ensuring that exactly the same sequence of keystrokes is used each time.

With his letter, Peter supplied a table of the codes necessary to access the Twin functions by placing them in key definitions. Unfortunately the codes which Peter has used are for the pre-release version of Twin and do not apply to the current version. I have found out what the new version uses and tried to put these codes into “key” statements, but they don’t work and it is probably better to use the idea of command files. (Unless anyone can offer a better solution.)

For those of you still using the pre-release version it may be helpful to know that these codes can be placed into key definitions by using an extended form to get the codes above 127. The f10 key is used as f0, followed by f1 to f9 and then COPY, LEFT, RIGHT, DOWN and UP.

Plain f0 is represented by |!|@ then the sequence follows with |!|A to |!|O for UP. Shift f0 is |!|P through to |!|Z for shift f9. Control f0 to f9 is |!|<space> followed by |!| and so on through the shifted number keys and finally shift/control is represented by |!|0 through to |!|9. (Note that there is only one ‘l’ character in the last two definitions.)

Full release Twin

There can be no doubt that the extra facilities and improved documentation of the full version of Twin make it well worth the effort of sending for the upgrade but, before I say very much more about it,

I want to see what the new editor is like. One big advantage of the new program is that every user of RISC-OS will have a copy, so that there will not be any confusion between different versions, but we will have to wait to see if there are problems to counterbalance this.

One way in which Twin can be made much easier to use is to change the filetype of those files which will be edited regularly using Twin and then set the runtime for this type of file to *twin %0. All you will need to do then is type *filename and you will enter Twin with the correct file loaded. If you do not have Twin available on your disk, it is possible to turn it into a module and so have it ready when you want it. (I know that Risc User published a program to do this but can’t remember if it’s been in Archive.) (No, it hasn’t, but see Risc User 1.6 p 33. – Oh, I do like this new disc index for RU and Archive!!! Ed.)

Ada

Dave Shepherd of Shrivenham has sent a note about using Ada, which he describes as “Pascal for masochists” on the PC emulator. The version used was JANUS/ADA, which costs about £100 for the basic version and £340 for a rather fuller version incorporating maths functions and string handlers.

He points out that it is rather slow, taking 6 to 7 minutes to compile and 2 to 3 minutes to link. In spite of this, you will probably find most of the compile time errors in the first two or three minutes and can stop the compilation and make the necessary amendments ready for another run.

While I don’t think that it is yet a language to be added to our regular set, it could be of considerable value to someone who can’t wait to get back to the computer at work to find out whether a programming idea will work.

APL

I have been sent a copy of a little magazine called “The Education Vector” which is addressed to those who are using APL in education.

If, like me, you had tended to think that APL was a language used by those whose keyboards were covered in peculiar marks, you might be interested

to see some of the things which school children are being encouraged to do. In two separate articles, the magazine refers to the use of APL on BBC and Archimedes micros and it looks as though these versions of the language are well developed.

Further details of APL in education can be obtained from Dr Alan Sykes, Dept of Management Science and Statistics, University College of Swansea, Singleton Park, Swansea, SA2 8PP.

Pascal

Ian Stafford of Blyth has asked for more details of extending Pascal by using Operating System calls and machine code. I'll be including a few more procedures in this line over the next few months and it would be helpful if you would write in with any particular requirements.

Ian's particular requirement is getting round a bug which duplicates the 10th (sic) parameter on the command line. I'm not quite sure why anyone needs 10 parameters but I don't think that machine code is the way to solve this problem. Machine code is necessary in some circumstances, but it will always be better to use a Pascal solution if one exists – largely because you are dealing with matters which hopefully will be kept consistent from one release to the next.

Perhaps the best solution to the parameter problem is to write the file names to a file which can be read by the program as part of the initialisation routine. Don't forget that the RESET and REWRITE statements can include variables as well as literals although, as explained in the article about Acorn extensions, it may be necessary to leave the files out of the program header if they are text files.

An advantage of doing it this way is that you may be able to re-use the same file definition for more than one file if they do not need to be open at the same time. This will often be the case when you are combining several input files into one output file.

If you decide to use the idea of a parameter file it may be a good idea to ensure that the file name strings are all the same length, padding them with spaces where necessary, and the declare the file to be a file of records. This is quicker to read than a text file as the whole record can be read with one statement.

Validation of data

I noticed that the BASIC V forum in the last issue of Archive contained a long description of the ON ERROR commands and how to use them. I would like to suggest that there should not be any of these statements in a finished application program apart from two minor exceptions.

My objection is not that they don't work, because they do, but because they come into play too late. Typical uses are to trap "divide by zero" and "square root of a negative number" errors, but the error isn't trapped until the calculation is being done.

When you think about it, we actually know that there is an error well before this – and then is the time to trap it. Why are we trying to divide by zero? Often it is when we do something like trying to calculate the average of a set of numbers, but none have been typed in yet. In a case like this, we could have told the user that there were no numbers as soon as the request to do the calculation was made and have the problem rectified before any calculation is done.

In the early days of personal computing many of us tried writing a program to find the roots of a quadratic equation, as it was the one bit of pure mathematics that most of us could remember. As we worked on it, we found that the formula $(-b \pm \sqrt{b^2 - 4ac}) / (2a)$ could fail if 'a' was zero or if $4ac$ was bigger than b^2 , and we put in "On error" statements to prevent the program from crashing.

This made sense at the time because users of this program were usually the same people as the programmers and were either "testing" the program or doing their maths homework. As we progressed, we got rid of the second problem by amending the program to provide complex numbers as the results if necessary.

We would now write a procedure to do this job and put it into programs that are intended to have some relation with a real job. In this case, we shall know before we start whether or not complex roots are valid and can start validating accordingly. In many cases, this can be done as the data is being entered and by doing this we will avoid most of the errors before they can happen.

Writing validation programs can be very tedious but if it is done well, it increases the user-

friendliness of the program immensely. Most people like a program that checks what they are doing and then gives them the result they need rather than stopping with a system error message.

On another occasion I might come back to more aspects of validation, because I feel that it is a very important aspect of good programming, but I will close by saying what the occasions are when I

would leave the "on error" statements in. One of them is to deal with disc errors, as they cannot usually be trapped by the program, and the other is to trap the use of the "Escape" key to allow a help screen to be printed. Other than that, I feel that the error traps are the programming equivalent of "Tippex" – a very useful product which we should be trying to make unnecessary. **A**

BBC Compatibility – Program Conversions

Richard Averill

In this month's BBC column, we present some modifications for BBC programs enabling them to run under the Archimedes. We have modifications for Sharemaster by Synergy Software, with thanks to Gordon Barker, and for "CharDes" – the BBC character set designer supplied on the Master 128 welcome disc.

The example of the Sharemaster program illustrates the present unwillingness of some software houses to convert their applications to the Archimedes. This seems to be a rather short-sighted policy that loses custom for software houses and we hope that, as the Archimedes gains more recognition (and as more Archive readers complain to software houses about the lack of an Archimedes version of a particular product!), more software will be converted. Synergy Software lead the way in the competition to make their applications obsolete with their refusal to upgrade to the Archimedes!

It is true, of course, that the cost involved in converting programs can sometimes be quite large, but with programs requiring simple modifications such as Sharemaster, surely this could have been investigated? But this, of course, is where you, the readers, come in! We would be delighted to print any conversions to BBC programs that enable them to run. Please contact us (see a few paragraphs below) with the relevant information.

You may notice that any alterations to programs have been listed as commands to be typed in from the keyboard. This saves space and provides another advantage where the alterations are quite long (as in the modifications for 'Sharemaster' and 'ViewPlot' – see Archive 2.3 pp 15-16) i.e. the alterations can be provided as an exec file which

will convert the programs automatically. For example, to modify 'Sharemaster' to run on the Archimedes, select the directory in which the 'Sharemaster' programs are held and type '*Exec ShareMods'. The exec files are provided in the 'BBCColumn' directory of the monthly disc, and this will be the BBC column policy in the future.

If you have any modifications of this kind (or other items for the BBC column) then we would be delighted to hear from you! Please write to me, Richard Averill, c/o Norwich Computer Services, enclosing a list of modifications, preferably with a 640k disc copy, and we will hopefully be able to include them in a future BBC column with acknowledgements.

Similarly, if you have a BBC program that you would like to run (or need to run!) on the Archimedes (whether in native mode or under one of the various emulators), please contact us and we may be able to offer advice on the necessary conversion.

Sharemaster by Synergy Software

Gordon Barker writes ...

I purchased the above program for use on the original BBC computer, subsequently transferring it to the Master although I had to use the DFS mode.

I then traded up to an Archimedes 310, but of course had no DFS capability, only ADFS including hard disc. I copied my working DFS "Sharemaster" discs onto ADFS ones. When "booted" the program would not run, although it attempted to do so.

I telephoned Synergy Software who told me that "it would run on the Archimedes under the 6502 emulator but not in ADFS." This seems to be a contradiction as I now have no DFS! (*Synergy might be referring to the BBCrun 6502 emulator*

from Resource – see below. Richard.) They were apparently not interested in upgrading the program for Archimedes use, suggesting that I part-exchanged my original for a CP/M version (for £75!) and used the PC emulator. (I thought the PC emulator emulated a PC and not a CP/M machine! Richard.)

I then listed the various programs on their disc and made some changes. One problem was that the original program would not accept the disc changes called for on the screen. Deleting the lines that called for this event, and those that tested that the correct disc had been inserted, solved most of the problems. All the programs and all the individual holdings files are now held on the same disc. On the original, three discs were needed to hold the data, but the added capacity of ADFS makes this unnecessary. The other changes needed were to make the return to the menu program work properly.

Eventually the suite of programs all ran properly. I will be the first to admit that I do not know why! (It also works on the hard disc.)

(Note: we have just received a communication from Gordon and he says that in the “performance” menu, all except total cost, total valuation and total gains can be printed, although they can be shown on the screen. Perhaps someone could help on these, as we do not have “Sharemaster” ? Richard.)

Alterations required

(We assume that, after modification, the Sharemaster programs run in ‘native mode’ and, by doing so, offer a large increase in speed compared to versions of Sharemaster running on other machines. Richard.)

```
*|> ShareMods
*|Running Sharemaster on the
Archimedes.
*|By Gordon Barker, January 1989.
From Archive BBC Column 2.
LISTO 1
LOAD "MENU"
3100 IF Xi=49 THEN CHAIN"EDIT":END
3110 IF Xi=52 THEN CHAIN"PORT":END
3120 IF Xi=50 THEN CHAIN"PRICE":END
3130 IF Xi=51 THEN CHAIN"CHART":END
3150 IF Xi=53 THEN CHAIN"ANLY":END
```

```
3180 IF Xi=55 THEN *FX200,0
3190 IF Xi=55 THEN *QUIT:*BASIC
3192
3220
SAVE "MENU"
LOAD "PORT"
141 DEF PROCQ:CHAIN"MENU":END
430 CLS
SAVE "PORT"
LOAD "EDIT"
900 CLS
1800 DEFPROCV:CHAIN"MENU":END
SAVE "EDIT"
LOAD "PRICE"
70
291 DEFPROCV:CHAIN"MENU":END
2630 CLS
SAVE "PRICE"
LOAD "ANLY"
90 DEFPROCV:CHAIN"MENU":END
2630 CLS
SAVE "ANLY"
LOAD "CHART"
50
3850 IFTD%<>7 PROCs
6100 DEFPROCV:CHAIN"MENU":END
SAVE "CHART"
```

CharDes from Acorn

Modifications by Richard Averill

The CharDes program is supplied on the Master 128 welcome disc. It is a BASIC program with the filename “CharDes”. Conversion is fairly straightforward, being mainly to convert the font files produced into the “BBC Font” format of the Archimedes. A point to note is that “BBC Font” files are just *PRINTed, so they could contain any VDU codes, for example VDU 22,n to change screen mode. By using *APPEND, text displaying the name of the font and version number can be added to the file : these will be displayed when the font is loaded in.

```
*|> CharDesMod
*|Running CharDes on the
Archimedes.
*|By Richard Averill, February '89.
From Archive BBC Column 2.
LISTO 1
```

```
LOAD "CharDes"
511 SYS "OS_File", &07,G$,0,0,0,0:
      SYS"OS_File", &12,G$, &FF7:
      outfile%=OPENOUT (G$)
512 FOR ra%=32 TO 255:R?0=23:R?1=ra%
      :SYS "OS_Word", &0A,R+1
513 FOR ra2%=R TO R+9:BPUT#
      outfile%,?ra2%:NEXT
514 NEXT
520 CLOSE# outfile%:PROC@("Saving
      complete"):H=GET:
      OSCLI"FX138 0 "+STR$H
580 DEFPROC:ENDPROC
SAVE "CharDes"
```

Useful addresses

Resource : Exeter Road, Doncaster DN2 4PY.
(Telephone : (0302) 63800 / 63784.)

Eureka II – Alive and well!

Alan Glover

By the time you read this we will probably have had over 2000 log-ins, and around 240 users! (2120 and 261 at the time of editing – 29th March. Ed.)

Special Interest Groups

Until recently there have been just three SIG (Special Interest Group) areas, which has allowed me to watch them and decide how the areas should be expanded. I have now expanded the SIGs. The full list is now as follows:

01 Private Mail

You cannot access this as a SIG – but I know a few people have wondered what SIG 1 is!

02 Archive News

Closed area for Archive members only.

03 General news/comment

News and comment area accessible by all.

04 Graphics/Sound

Technical help on graphics and sound matters.

05 Arthur/RISC-OS

Technical help on Operating System matters.

06 Hardware

Technical help on hardware matters.


07 Software

Technical help on software matters

08 Communications

Technical help on communications matters

The aforementioned BBCRun emulator from Resource (a review appeared in Archive 1.7 p 41) costs £15.95. If you are one of the people who have missed out on Arthur 1.2 by jumping straight into buying an Archimedes with RISC-OS installed, then you will not have a copy of the 65Arthur emulator provided with Arthur 1.2.

65Arthur is a good deal faster than the 65Host provided with RISC-OS and, although 65Arthur is not as compatible, it is still a useful piece of software. This is provided on the BBCRun disc, along with other utilities: DFS emulation, screen/character conversions and program scanning amongst others. My recommendation to any Archimedes owner who has come from the BBC micro is to buy these utilities straight away before the rush! 

09 Errm!

Technical help on all the things which I haven't categorised!

10 Puzzles/Adventure Help

A lighter area, with some puzzles, and adventure help. My thanks to Richard Forster for offering to look after this section.

11 Debate

A debate could be defined as a 'meeting of minds, without a knocking together of heads'. This area is intended for thoughtful expression of differing views and opinions.

12 Free Adverts

For users to advertise Archimedes bits and pieces they want/don't want.

13 Games

For anything to do with games (non-adventure), e.g. latest news, mini-reviews, cheat modes etc

14 The Lighter Side

I'm going to use this area to give vent to my sense of humour. I'll be putting in things which amuse me and hopefully others too.

15 Eureka II News

16 Viruses

17 Bug or Feature?

18 Rumours and Other News

19 Archive Contact Area

Hardware

The board is now running on a special version of the Miracom WS3000 V22bis modem which can auto-answer Reverse V23 (i.e. you transmitting at 1200 baud for uploading) as well as V21, V22(bis) and normal V23.

Modems for All

How about Archive trying to arrange a deal on modems (2400 baud) so that we can all get through at higher speed to help minimise the logjam? Let us know if you would be interested.

The Victim of its Own Success

Eureka II is getting to be the victim of its own success. Those who have tried to get onto Eureka II recently will know what I mean – it has become rather popular, to say the least. It is very frustrating if all you want to do is to check if there are any messages for you.

The most obvious way to get round this would be to enforce a time limit for access but that idea has a number of weaknesses. If this theme sounds familiar you might like to look back to Tim Saxton's article about intelligent BBs in Archive 2.1 p 11.

In the short term, there are a number of changes waiting to be coded which will simplify things (i.e. cut down the time spent online).

- 1) Option to override the continue/abort prompt
- 2) User selection of desired SIG areas for new message scanning
- 3) Option to do a continuous output for spooling when doing a new message scan
- 4) Facility to accept a similar file in return containing new messages and mail for posting. This would be uploaded as a file (probably non-arc'd) and then split into constituent messages and delivered after the end of the call.

Of course these are only preventative measures, more ambitious ideas being considered include:

- 1) A second telephone number, with time-limited access to all parts of the board – which run as a slave of the main board. In this idea, the slave simply collects new messages etc and transfers them to the main machine when both are free.

- 2) A second telephone number, with divided functions. System 1 would be unlimited, with access primarily to the download areas and System 2 would be time-limited with chiefly the messaging areas. This is just an idea at the moment, so the precise mechanics of the overlapping between the two have not been defined yet.

However, before we consider proceeding with this we'd like to know the extent of the problem...

Please take a few moments to write a letter or send an mbx to me with your answers to these questions:

- How many attempts do you usually need to get on to Eureka II?
- What time of day is this usually?
- Do you feel that the board is becoming too crowded?
- Have you any ideas for reducing congestion without restricting users unnecessarily?

If you think I might be offended by your comments (but I wouldn't be, honest!) send them to Paul Beverley instead. (Account 21).

Registration Password

If you haven't tried to access Archive yet, give it a ring on 01-683-0629. To register and get full access to the Archive areas, select <R> from the main menu and use this month's Archive registration word which is "Mushroom". (*'Cos there's not mushroom left on the hard disc with all those downloads? Ed.*) **A**

Contact Box

• **Bar-code Readers** – If anyone is doing anything with bar-code readers, especially with Minerva's Stock control program, please contact John Dale, 57 Springfield Road, Burnley, BB1 3LR.

• **Danish Bulletin Board** – A BBC/Archimedes user group in Denmark runs a bulletin board – 300/1200/2400 baud, 8n1, scrolling terminal on (Denmark) 1-38-81-48. (From 1st May, it will change to 31-38-81-48). Or contact Thomas Christiansen, Rosenvængets Alle 1, 3th, DK-2100 Østerbro, Denmark. **A**

Which Computer? Show Report

David Bilsby

Acorn's stand grows every year and each year they unveil new products. This year's stand displayed eight Archimedes 440's and six Archimedes R140's, plus a couple of Masters. Acorn had divided their stand up and given the use of some of their Archimedes computers to third party companies like Clares, Colton, Wild Vision and Oak Professional Software.

Clares Micros

Clares were showing off their new ProArtisan and their ray tracing package, Render Bender. The first has been reviewed already (2.3 p19). The second, Render Bender, is a very sophisticated package for drawing realistic scenes from fairly basic shapes like spheres, cubes, cylinders, etc. and adding several light sources, giving surfaces a matt or reflective finish, or making it transparent with a specific refractive index. The program then fairly slowly, but very fast compared to other computers like the Amiga, draws the scene with every reflection, refraction and shadow perfect. The demonstrations are stunning to say the least and comparable to those achieved by NASA's Cray 1 supercomputer and a little less expensive too!

Colton Software

Colton Software were also there, showing off Pipe Dream. One personal criticism about Pipe Dream is that you cannot include graphics. This, however, according to the representative from Colton may be rectified in later releases of PipeDream.

Wild Vision

Wild Vision were there showing their Genlock and Image Processing Systems. Their Chroma 300 genlock system was demonstrating 16 colour scrolling text over a live video picture. Their Image Processing package (which includes a digitiser and image manipulation software built onto one double width board) was digitising from a video camera in real time. The images can be displayed on a separate screen in 256 grey shades and a resolution of 256 x 256, so leaving the computer monitor free for other things. The software was also able to colour digitised image quite realistically.

Oak Computers

Oak Professional Software had an Archimedes running their new 2D Parametric Design Tool (P.D.T.) CAD program. Unlike a normal CAD program on other computers, this one does not just describe the picture with coordinates but as actual relationships between objects. If, for example, a line is defined as being tangential to two circles but you decide to change the radius of one circle, then the P.D.T. will automatically move the line so that it remains tangential to both circles. A standard CAD program would leave the line in its original position after the circles radius has been edited. It can also be used to model complex mechanical linkages and do real time animation of prototypes.

The Acorn R140

Along the back of Acorn's stand was a line of six Archimedes R140's, Acorn's new UNIX based system. Apart from the words 'ACORN R140' on the front panel there is no visible difference between it and a 310 or a 440. The screen shows an X.Widows environment of standard UNIX systems, in IBM VGA style graphics (640 x 480 and 16 colours). The hardware also allows the possibility of having an ultra hires monitor of up to 1152 x 900 monochrome, this being the same resolution as the more familiar SUN workstations. The R140 is designed for open distribution UNIX systems with connection to IBM PC's, SUN's, mini and super-mini computers, all on Ethernet system together with the Mainframe. This system eliminates the idea of a dumb terminal around a central mainframe and all the problems associated with it. It allows for normal access to the system and devices on other computers around the network but also provides extra processing power and storage.

RISC-OS

Finally, were several Archimedes computers running RISC-OS. If you have ever used the Macintosh desktop, as I have, and have loved its user-friendly nature, you will not be disappointed with RISC-OS. The desktop no longer is in garish colours but subtle greys. The computers were running in the multi-tasking environment with a

simple BASIC program producing funny looking fish swimming around the screen while other applications were running. (*Dave! That's the so-called Fish Virus! See page 30. Ed.*) The ability to drag files from directories to applications like the text editor and then to another application like a printer driver was so simple. File copying was also no trouble – just click on the file and drag it across to the new directory. A new feature I liked was the ability to run the desktop in virtually any mode including multisync, like mode 20.

File-Server

All the computers on Acorn's stand were linked via their new file server system by Ethernet and Econet cables. The new file server is just a plain light beige coloured box, similar in appearance to the record

deck on a stacking hifi. On top of this stand-alone unit can be placed up to four hard disc drives of either 40 or 60 megabytes. The file store unit (the E01S) needs no accompanying computer to run the network as it does it automatically for itself, so freeing the file server computer for normal use again. Any number of filestore units can be placed in a system to increase the storage and speed up the access time.

Overall, the show was very popular with business men and the general public. Acorn's stand was never short of interested people admiring the Archimedes. This sort of publicity for Acorn at a mainly business show will help them to shake off the old image of the BBC Micro and establish their place in the home, educational and business markets. **A**

BASIC V Forum

Clifford Hoggarth

This month we will look at the building blocks of BASIC programming...

The RISC-OS version of the BASIC interpreter is the latest version of BBC BASIC which, since it first appeared, has been heralded as one of the best dialects because of the constructions available. Initially these were the usual FOR... NEXT loop, supplemented by the REPEAT... UNTIL loop and most importantly PROCedures and FuNctions.

One feature missing was the WHILE...END-WHILE instruction, despite being in the initial specification documents. This has been incorporated in BASIC V along with the CASE...ENDCASE and multiple line IF...THEN...ELSE...ENDIF statements.

This set provides a powerful programming environment which, thanks to the RISC processor, is also fast enough for many applications which would usually require a compiled language.

To achieve the possible performance levels requires the correct choice and use of the various constructions, and this article hopes to provide some pointers towards this aim.

IF...THEN...ELSE...ENDIF

The important thing with this is that the THEN statement MUST be the last thing on the first line

otherwise the flow of the construction will go awry. This includes REM statements which it is often tempting to place after the THEN to comment on the test, this should NOT be done. Therefore

```
IF flag=condition THEN :REM tests
                        for something
```

```
...
ELSE
...
ENDIF
```

will NOT work properly, instead use

```
REM tests for something
IF flag=condition THEN
...
ELSE
...
ENDIF
```

which will work correctly.

FOR...NEXT

This type of loop should be used when a start and end limit are known in advance. The loop can be used to execute a piece of code a fixed number of times e.g.

```
FOR count=1 TO number_of_times
...
NEXT count
```

Alternatively the control variable can be used to step regularly through a series of values, either in ascending or descending order.

```
FOR value=start_value TO
    end_value STEP step_value
...
NEXT value
```

The first time through the loop, `value=start_value`, when the `NEXT` statement is reached, `value` is adjusted by the amount indicated by `step_value`, either increasing or, if `step_value` is negative, decreasing. This continues until `value` is greater than `end_value` (for a positive `step_value`) or `value` is less than `end_value` (for a negative `step_value`). When this occurs, the program continues with the statement following the `NEXT`. If `value` is exactly equal to `end_value`, the loop will be executed, it is only when the limits specified are exceeded that the loop is terminated. Note that a `FOR...NEXT` loop is always executed at least once. Also this is the fastest type of loop.

REPEAT...UNTIL

This type of loop is used to `REPEAT` a series of instructions `UNTIL` a certain condition is met. It can be used in a similar manner to a `FOR...NEXT` loop:

```
value=start_value
REPEAT
...
value+=step_value           :REM or
    value-=step_value
UNTIL value>end_value       :REM or
    value<end_value
```

This is however, slower than a `FOR...NEXT` loop. One advantage is that the `step_value` can be altered during the loop. It is not advisable to test for `value` being equal to `end_value` if `value` is a floating point variable. This is because rounding errors can lead to an exact value not occurring and the loop continuing indefinitely. (This is not a problem with string or integer variables i.e. `value$` or `value%`).

```
Try
value=0
REPEAT
    value+=0.001
    PRINT value
UNTIL value=1
```

`REPEAT...UNTIL` loops are more commonly used

to allow you to process the same piece of code until a particular condition occurs, e.g. the main loop of a program could continue until a quit option is selected. A flag could then be set and tested for at the end of the loop e.g.

```
REPEAT
...
UNTIL quitflag
```

Similarly the end condition could be a specific key press, etc.

A `REPEAT...UNTIL` loop is always executed at least once.

WHILE...ENDWHILE

This is essentially the same as the `REPEAT...UNTIL` loop except that the test is performed at the start of the loop rather than at the end. This means that, unlike the loop structures above, it is possible for the loop contents not to be executed at all.

The other difference is that `WHILE...ENDWHILE` loop continues as long as the test condition is `TRUE`, whereas the `REPEAT...UNTIL` loop continues as long as the test condition is `FALSE`, i.e. opposite tests must be performed.

CASE...ENDCASE

The major addition to BASIC has been the incorporation of a `CASE` statement. This can be simply considered as a method of implementing multiple `IF...THEN` statements all testing the same variable but for different values. The structure is as follows:

```
CASE variable OF
WHEN value1
...
WHEN value2
...
OTHERWISE
...
ENDCASE
```

If `variable=value1` then the code between `WHEN value1` and `WHEN value2` is executed and the program flow then continues from the `ENDCASE` statement. If none of the list of values is matched then the code following `OTHERWISE` is executed, whatever the value of variable. If an `OTHERWISE` statement is not present, the program will simply continue from `ENDCASE`.

Multiple values can be tested for together by using:

```
WHEN value1,value2,value3,...
```

These could be further separated by additional CASE statements or IF...THENs. It is important not to confuse the test for variable=value and other conditional tests. For example, WHEN value AND othervariable=2 will not work because the expression 'value AND othervariable=2' will firstly be evaluated to a TRUE/FALSE value i.e. -1 or 0. The WHEN statement then becomes WHEN 0 or WHEN -1, which is not what was meant. This type of test must be performed using a separate IF...THEN e.g.

```
WHEN value
IF othervariable=2 THEN
...
ENDIF
WHEN ...
```

This can sometimes be used in conjunction with the OTHERWISE statement to test for a group of values which can have a test applied to them e.g.

```
OTHERWISE
IF variable>5 AND variable<20
THEN
...
ENDIF
...
```

Note that using this latter method means that the meaning of OTHERWISE has changed – only certain values will execute this part of code, rather than all unmatched ones as is normally the case. Use of an ELSE in the last example would overcome this.

Well that was just a brief overview of what is available in BASIC V, and a few pointers as to the traps which can cause difficult-to-trace bugs in programs.

More about LOCAL...

The previous article described the use of RESTORE +<offset> with the latest version of BASIC V. Another enhancement of DATA statements is the use of LOCAL DATA and RESTORE DATA to set up a temporary data pointer. This, coupled with the use of RESTORE +<offset>, in a procedure allows very flexible use of DATA statements e.g.

```
DEF PROCexample
LOCAL count,n
```

```
LOCAL DATA
RESTORE +0
DATA 1,2,3,4,5
FOR count=1 TO 5
READ n
NEXT
RESTORE DATA
ENDPROC
```

As with RESTORE ERROR, the RESTORE DATA will be automatically performed by ENDPROC if not done explicitly.

LOCAL DATA should be the last thing to be declared LOCAL except for LOCAL ERROR which must ALWAYS be the last LOCAL statement, an important point omitted from the last article.

PROCoscli

Listing 1 shows a procedure for simulating the supervisor command line from within a program. This starts by enabling cursor editing with an *fx 4 command. The text cursor is separated from the graphics cursor and positioned on the bottom line of the screen. A "*" prompt is displayed and a string read using INPUT. Each string input is then passed to the CLI by the OSCLI command. Output will be as normal. Pressing <return> at the prompt returns to the program after first disabling the cursor editing (if required), and calling a procedure to reset the screen contents to the previous state.

A local error handler is used so that errors generated are reported correctly. This also allows pressing <escape> to abort a command without stopping your program (assuming <escape> is enabled).

Listing 1

```
DEF PROCoscli
OSCLI("fx 4")
VDU 4
PRINT TAB(0,31)
LOCAL ERROR
ON ERROR LOCAL REPORT:PRINT
REPEAT
INPUT"*"oscli$
OSCLI(oscli$)
UNTIL oscli$=""
RESTORE ERROR
OSCLI("fx 4 2")
PROCredraw_screen
ENDPROC A
```

SYS and the RISC-OS Sprite Editor

Gerald Fitton

Gerald continues his series about the SYS command but stops off on the way to look at the RISC-OS application, !ArcPaint.

By the time this issue of Archive arrives on your doorstep, the Editor of Archive will have posted about a thousand copies of the Archimedes' new operating system; or if he hasn't then you will have been worrying him about it – that's for sure! The new sprite editor supplied with RISC-OS is called “!ArcPaint”. It can be used for things other than creating sprites, but this will be one of its major uses and you may like to have a go with “!ArcPaint”. This month, out of courtesy to those without RISC-OS, we'll make our sprite from BASIC and use “!ArcPaint” only to modify it to have a transparent mask. If you don't have RISC-OS then you can use the old Arthur sprite editor to create the transparent mask. Having created the sprite, if you have RISC-OS then you can run a BASIC program from within DeskTop which plots the sprite four times on the screen. Firstly we'll use the System Sprite Area and its associated operating system *-commands and then, later, convert the program to SYS calls that do the same thing.

Let's write a structured program

The program “SysFX010” is an example of a structured program, written in BASIC. It creates a sprite that looks a bit like a globe, stores it on a disc, loads it back into the machine and plots it four times to the screen. In this program there is not a SYS to be seen. Instead, we are using *-commands which call routines in the Operating System. When we are satisfied that this method works we shall replace the *-commands with their equivalent SYS calls. A further modification to the SYS version will let us create our own User Sprite Area.

I am calling the program “structured” partly because it is divided into three distinct parts, partly because there are no GOTOS, no GOSUBs or anything which depends on line numbers but also because of the way in which variables are used. These three sections are the “Pre-Core Section”, the “Core Section” and the third part which consists of

PROCedures. Generally, the core section of a program should be short and consist of nothing else but calls to procedures. I have given the procedures meaningful names. It is these procedures that do the main part of the work of the program. In order to emphasise the segregation into three parts I have chosen line numbers from 100 up for the pre-core section, from 1000 for the short core section and the procedures start at 10000 with PROCerror so that if you forget to type END (at line 1100) then no harm is done.

The Pre-Core Section

From the SysFX (or whatever is your top) directory, type *CDIR BasicProgs and *CDIR MySprites to create the two new subdirectories used in this program. I name the program at line 100 (you must RUN and SAVE the program from the SysFX directory) so that it can be saved by using the command SAVE without naming the program every time. I define the action to be taken if an error occurs (190), choose the mode (line 220 – essential if we want a simple way of taking over the whole screen from within the desktop environment) and then declare the global variables (these are variables that are common to the whole program – in other words reserved variables). This version (named as version 0.00 at line 130) uses no global variable ('globals'). When we come to deal with the type of variable known as “parameters” next month, then we shall need some globals.

The Core Section

This consists of calls to the five procedures used by the program and practically nothing else. The procedures have meaningful names to help readability. The operating system command *SNEW deletes any sprites held in the system sprite area. The sprite which we are going to create is just over 32k in size so you may have to increase the size of the system sprite area. To do this in RISC-OS you should SAVE your program, then type QUIT followed by *Configure SpriteSize 64k. Reset the machine by pressing <ctrl-reset> and then return to BASIC by typing *BASIC. Reload your program. The *Configure command is a little different in

Arthur, it is either *Configure SpriteSize 8 or *Configure SpriteSize 2 depending on whether you have a 310 or 440.

PROCerror (10000 – 10090)

The simplest version of an error trap you can have!

PROCdrawglobe (10100 – 10490)

Self-contained procedures are the building blocks of structured programs. A self-contained procedure is one which contains no global variables. All the variables used in PROCdrawglobe are declared as LOCAL at line 10120 so that the computer forgets all about them after it has left the procedure. Another tenet of good programming is "Never use a value when you can use a variable". I have used the local variables size% for the size of the square sprite, (left%,bottom%) for the co-ordinates of the left bottom corner of the sprite and the variable, angle1, for the angle through which it is rotated. These local variables have values assigned to them at lines 10150 to 10220. You can vary angle1 (10210) and make size% smaller (10150) if you want to experiment. By using variables instead of values you need change only one line of the program and the effect ripples through the rest. We shall extend this idea further with globals and parameters next month. If a procedure is self-contained then it can be called from the > prompt. Make sure you are in MODE 12; then type "PROCdrawglobe <return>" and a globe should appear near the centre of the screen. The globe is drawn in two halves (10320 and 10420), it has an axis inclined at $3\pi/8$ radians to the horizontal (10260) and an elliptical loop, a satellite orbit, around its centre (10360). By drawing the globe in two halves we hide part of the satellite orbit.

PROCgetsprite (10500 – 10690)

This procedure contains *SGET, our second operating system command, at line 10660. The syntax of this command is *SGET followed by the name of the sprite to be saved. Before using *SGET, you must MOVE to the bottom left and top right of the rectangle to be saved (10620 – 10630). The result of *SGET is to save the globe as a sprite in the system sprite area. Our sprite is called "globe".

PROCsavesprite (10700 – 10790)

The operating system command *SSAVE (10730)

is followed by the full pathname of the file, "MySprites.SpriteFile". "MySprites" is the name of the directory and the name of the file containing the sprite is "SpriteFile". It is possible to *SGET more than one sprite and store it in the system sprite area (provided you use a different name for each) but all of the sprites stored in the system sprite area are saved together in one file (SpriteFile) by the command *SSAVE.

PROCloadsprite (10800 – 10890)

The operating system command *SLOAD (10830) has the same parameter as the command *SSAVE, namely the full pathname of the file containing the sprites you want to load. You must be in the SysFX directory. You cannot *SCHOOSE (see next paragraph) a sprite from a sprite file until it has been *SLOADED.

PROCputsprite (10900 – 11090)

In order to plot a sprite (from the System Sprite Area) you must first select it with *SCHOOSE followed by the name of the sprite (11020). In our case, the sprite name is "globe". You can RUN the program as it stands. The sprite which we *SGET (10660) does not have a transparent mask so that the command GCOL 8,0 (11050) does nothing useful. To PLOT a sprite, you use the PLOT &ED command (11080) followed by a pair of graphics co-ordinates to show where you want the left bottom corner of the sprite to be located. This command is repeated at line 11090 but with the sprite shifted 384 graphics co-ordinates to the right. The shifted sprite is plotted twice more at lines 11100 and 11110.

Masks and !ArcPaint

SAVE the program and then RUN it. Because we have no transparent mask, the black rectangle of the second PLOT (11090) blots out part of the first globe. The third and fourth PLOTS (11100 and 11110) blot out parts of the earlier globes. Usually this is undesirable so we shall use "!ArcPaint" from within the DeskTop environment to modify our globe sprite so that the black background becomes transparent.

Make sure have saved your program. Modify line 100 so that the program name becomes "SysFX011" and delete lines 1030 to 1070. SAVE this new version and RUN it. The sprite file

"SpriteFile" loads at line 10830 and you will PLOT the sprite "globe" four times with later PLOTs blotting out part of the earlier ones as before.

Now we are going to use !ArcPaint to create a transparent mask. Type *DeskTop <return>. Using the mouse you should still be able to RUN both "SysFX010" and "SysFX011" by double clicking on the icons corresponding to these programs. If you get the error message "Not found at line 10730" then you are in the wrong directory. To correct this from within DeskTop, press the function key <f12> and then type *DIR :0.SysFX <return> or whatever is the full pathname of the SysFX directory. You return to DeskTop by pressing an extra <return>.

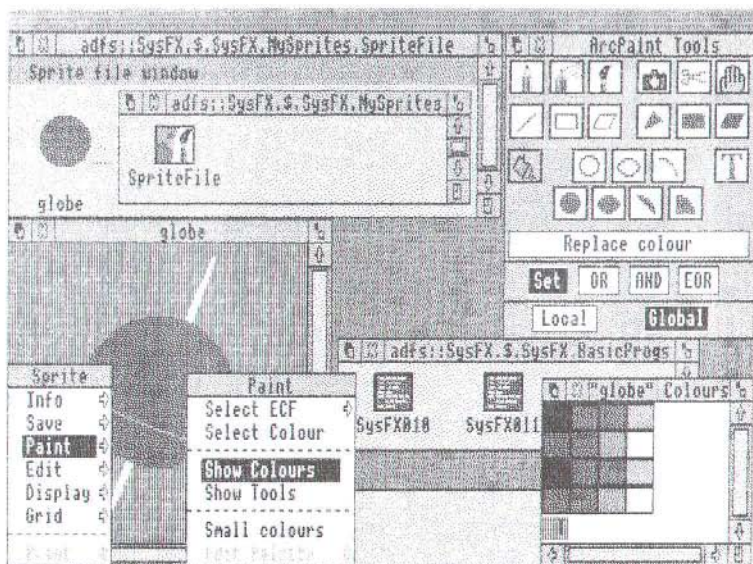
(The screendump below shows the various menus that open as you move about !ArcPaint. I hope it comes out clearly enough in print because looking at it will help you as you try to follow the following instructions.)

Put the disc containing !ArcPaint into your drive and double click on !ArcPaint. If all goes well then the !ArcPaint icon should appear on the icon bar at the bottom of DeskTop. Reinsert your SysFX disc,

find and double click on "SpriteFile". This will load "SpriteFile" into the !ArcPaint application. You will find a window called "SpriteFile" with a monochrome "globe" sprite in it. (It is in monochrome because DeskTop colours are not the same as the default colours for MODE 12.)

Place the pointer over the globe icon, press the middle (menu) button of the mouse and from the menu, run the pointer through "Info" and then "About this file". This will show the size of the sprite to be just over 16k. From the same menu run the pointer through Display, clicking on the words "Use desktop colours" to remove the tick. This will cause DeskTop to display the globe in MODE 12 colours (instead of its own) and so you regain a blue colour for the globe.

Double click on the globe itself and a new window called "globe" (a sprite editing screen) will open showing a large globe with a black background. Position the pointer inside this "globe" window, click the menu button of the mouse and then run the pointer through Edit to click on the word Mask. You have now doubled the size of the sprite to just over



32k. Make sure you have a tick on Palette as well as Mask before leaving this sub-menu; this saves the MODE 12 palette to the sprite. You can check that the sprite size has doubled by using "Info".

Back to the menu which had Edit in it but now run the pointer through Paint and click on Show Tools. Another window will open called "ArcPaint Tools"; click on the paint can (near the bottom left on my version) and yet another window (below but attached to "ArcPaint Tools") opens explaining the paint can icon as "Replace colour". Click on "Global" from this lower window. Back to the Paint menu, click on Show Colours and a palette appears called "globe colours". At the bottom left of this palette is a grey hatched "colour". This is the Transparency icon; click on it and a "T" will appear within the hatched area. Click on the black background of the edit window. The hourglass should now run and after about half a minute the black background should change to the hatched shade of grey; this indicates that the sprite now has a transparent mask. Finally, back to the small globe icon in the SpriteFile window. Press the middle (menu) button, follow the Save arrow, click on "OK" to save the modified "SpriteFile" file back in the MySprites directory.

Plotting the Masked Sprite

Whilst still in DeskTop double click on "SysFX011" and you should now get four plots of the globe but without the black area of the later plots obliterating the earlier ones. If you have used the old Arthur sprite editor because you don't have RISC-OS then you will have to RUN the program the old-fashioned way but, I hope, with the same result.

What about SYS?

There are two features of this program which reduce its "Portability" to a different type of machine. The first is the sprite PLOT command "PLOT &ED" which is not available in other dialects of BASIC; the second is the use of the Operating System Sprite commands which begin with a *. What the software houses have to decide is whether the advantages of using Archimedes sprite commands outweighs the disadvantage of having to rewrite the program if it is to be used on another machine (see comments in last month's article).

I do seem to have spent a lot of time on DeskTop and the !ArcPaint application (so I haven't got round to SYS yet), but at least you should be able to find your way around these RISC-OS features a little better now. You've also seen how the co-operative "Multi-Tasking" of DeskTop can be used to retain your sprite editor and sprites on screen and yet run a BASIC program that tests out those sprites. You might like to try changing the colour of the globe to red from within !ArcPaint, save the "SpriteFile" and then rerun "SysFX011".

I do promise that, along with globals and parameters, we will get around to User Sprite Areas (and SYS) next month.

```

100 REM > BasicProgs.SysFX010
110 REM Author : G L Fitton
120 REM Copyright : ABACUS TRAINING
130 REM Version 0.00 :14th March 89
140
190 ON ERROR PROCerror
200
220 MODE 12
230
240 REM Declare global variables
260
1000 REM Core Section
1020 *SNEW
1030 PROCdrawglobe
1040 PROCgetsprite
1050 PROCsavesprite
1060 CLS
1070 CLG
1080 PROCloadsprite
1090 PROCputsprite
1100 END
1110
10000 DEF PROCerror
10010 REM Reports an error
10050 REPORT
10060 PRINT " at line ";ERL
10070 END
10080
10100 DEF PROCdrawglobe
10110 REM Draws a globe to be used as
a sprite
10120 LOCAL left%,bottom%,xc%,yc%,
size%,rad%,angle1,angle2
10130
10140 REM Initialise variables
10150 size% = 512

```

```

10160 left%   = 640    -size%/2
10170 bottom% = 512    -size%/2
10180 xc%     = left%  +size%/2
10190 yc%     = bottom%+size%/2
10200 rad%    = size%/4
10210 angle1  = 3*PI/8
10220 angle2  = angle1-PI/2
10230
10240 REM Draw globe axis
10250 GCOL 7
10260 ELLIPSE FILL xc%,yc%,size%/2,
           size%/64,angle1
10270
10280 REM Draw globe bottom half
10290 GCOL 4
10300 MOVE xc%,yc%
10310 MOVE xc%-rad%*COS(angle2)
           ,yc%-rad%*SIN(angle2)
10320 PLOT &B5,xc%+rad%*COS(angle2)
           ,yc%+rad%*SIN(angle2)
10330
10340 REM Draw satellite orbit
10350 GCOL 6
10360 ELLIPSE xc%,yc%,size%/8,size%/2
           ,angle1
10370
10380 REM Draw globe top half
10390 GCOL 4
10400 MOVE xc%,yc%
10410 MOVE xc%+rad%*COS(angle2),yc%
           +rad%*SIN(angle2)
10420 PLOT &B5,xc%-rad%*COS(angle2),
           yc%-rad%*SIN(angle2)
10480 ENDPROC
10490
10500 DEF PROCgetsprite
10510 REM Pick up a sprite from screen
10520 REM Save it in the system
           sprite area
10530 LOCAL left%,bottom%,size%
           ,right%,top%
10540
10550 REM Initialise variables
10560 size%   = 512
10570 left%   = 640    -size%/2
10580 bottom% = 512    -size%/2
10590 right%  = left%  +size%-1
10600 top%    = bottom%+size%-1
10610
10620 MOVE left% ,bottom%
10630 MOVE right%,top%
10660 *SGET globe
10680 ENDPROC

10690
10700 DEF PROCsavesprite
10710 REM Saves sprite area to disc
10730 *SSAVE MySprites.SpriteFile
10780 ENDPROC
10790
10800 DEF PROCloadsprite
10810 REM Loads sprite file from disc
10830 *SLOAD MySprites.SpriteFile
10880 ENDPROC
10890
10900 DEF PROCputsprite
10910 REM Plots a sprite to screen
10920 REM from system sprite area
10930 LOCAL left%,bottom%,xstep%
10940
10950 REM Initialise variables
10960 left%   = 128
10970 bottom% = 128
10980 xstep%  = 384
10990 ystep%  = 384
11000
11010 REM Choose the sprite
11020 *SCHOOSE globe
11040 REM Use a mask
11050 GCOL 8,0
11070 REM Plot the sprite four times
11080 PLOT &ED,left%,bottom%
11090 PLOT &ED,left%+xstep%,bottom%
11100 PLOT &ED,left%+xstep%,bottom%
           +ystep%
11110 PLOT &ED,left%,bottom%+ystep%
11160 ENDPROC

100 REM > BasicProgs.SysFX011
110 REM Author   : G L Fitton
120 REM Copyright : ABACUS TRAINING
130 REM Version 0.00 :14th March 89
140
190 ON ERROR PROCerror
220 MODE 12
240 REM Declare global variables
250
1000 REM Core Section
1020 *SNEW
1080 PROCloadsprite
1090 PROCputsprite
1100 END
1110

```

```

10000 DEF PROCerror
10010 REM Reports an error
10050 REPORT
10060 PRINT " at line ";ERL
10070 END
10080
10100 DEF PROCdrawglobe
10110 REM Draws a globe to be used as
           a sprite
10120 LOCAL left%,bottom%,xc%,yc%,
           size%,rad%,angle1,angle2
10130
10140 REM Initialise variables
10150 size% = 512
10160 left% = 640 -size%/2
10170 bottom% = 512 -size%/2
10180 xc% = left% +size%/2
10190 yc% = bottom%+size%/2
10200 rad% = size%/4
10210 angle1 = 3*PI/8
10220 angle2 = angle1-PI/2
10230
10240 REM Draw globe axis
10250 GCOL 7
10260 ELLIPSE FILL xc%,yc%,size%/2,
           size%/64,angle1
10270
10280 REM Draw globe bottom half
10290 GCOL 4
10300 MOVE xc%,yc%
10310 MOVE xc%-rad%*COS(angle2),yc%-
           rad%*SIN(angle2)
10320 PLOT &B5,xc%+rad%*COS(angle2)
           ,yc%+rad%*SIN(angle2)
10330
10340 REM Draw satellite orbit
10350 GCOL 6
10360 ELLIPSE xc%,yc%,size%/8,size%/2
           ,angle1
10370
10380 REM Draw globe top half
10390 GCOL 4
10400 MOVE xc%,yc%
10410 MOVE xc%+rad%*COS(angle2),yc%
           +rad%*SIN(angle2)
10420 PLOT &B5,xc%-rad%*COS(angle2),
           yc%-rad%*SIN(angle2)
10480 ENDPROC
10490
10500 DEF PROCgetsprite
10510 REM Pick up sprite from screen
10520 REM Save it in the system
           sprite area
10530 LOCAL left%,bottom%,size%,
           right%,top%
10540
10550 REM Initialise variables
10560 size% = 512
10570 left% = 640 -size%/2
10580 bottom% = 512 -size%/2
10590 right% = left% +size%-1
10600 top% = bottom%+size%-1
10610
10620 MOVE left% ,bottom%
10630 MOVE right%,top%
10660 *SGET globe
10680 ENDPROC
10690
10700 DEF PROCsavesprite
10710 REM Saves sprite area to disc
10730 *SSAVE MySprites.SpriteFile
10780 ENDPROC
10790
10800 DEF PROCloadsprite
10810 REM Loads sprite file from disc
10830 *SLOAD MySprites.SpriteFile
10880 ENDPROC
10890
10900 DEF PROCputsprite
10910 REM Plots a sprite to screen
10920 REM from system sprite area
10930 LOCAL left%,bottom%,xstep%
10940
10950 REM Initialise variables
10960 left% = 128
10970 bottom% = 128
10980 xstep% = 384
10990 ystep% = 384
11000
11010 REM Choose the sprite
11020 *SCHOOSE globe
11030
11040 REM Use a mask
11050 GCOL 8,0
11060
11070 REM Plot the sprite four times
11080 PLOT &ED,left%,bottom%
11090 PLOT &ED,left%+xstep%,bottom%
11100 PLOT &ED,left%+xstep%,bottom%
           +ystep%
11110 PLOT &ED,left%,bottom%+ystep%
11120 ENDPROC

```

Trivia for the Archimedes

John Caulfield (& Philip Green)

A review of Arc-Trivia – £24.95 (£23.00 from Archive) for Archimedes 310 and up.

ArcTrivia, from Moray Micro, is a version of Trivial Pursuits similar to that found on Arcade or Pub machines, unlike earlier BBC versions which used graphic displays.

Presentation

It is presented as a single protected 3.5" disc with a small 16 page user manual in an A5 format plastic folder. Also included is a registration card which promises updates and information on supplementary question sets. The folder is attractive and the disc is a striking yellow directly printed with the program name and copyright notice. The manual is rather a disappointment; the small format combined with the rather poor print quality and total lack of contents list or index making it very hard to use. Having said that, the game itself is fairly self-explanatory anyway.

Getting started

I reviewed the game on my 310 which has a hard disc fitted as the default drive, so I *mounted drive 0 and pressed <shift-break> to start the program. The screen cleared with a message saying "Configurations not set correctly !!!!!" "Press <ctrl-break> then <shift-break> to retry with Spritesize 4". This was the first of the snags, not only did the program change the sprite size, but also RMA size, Screen size, RAM FS size, Font size and System size, all of these without first checking available memory and without provision for restoring previous settings on exit. Thoroughly bad practice!

I pressed <ctrl-break> followed by <shift-break> to re-start and was presented with the initial menu screen offering two mouse selectable boxes to choose between entering the game or the editor. This screen although very simple – consisting of rectangular coloured boxes with text – is nonetheless effective as it appears and, after selection, disappears with a gentle and smooth fade in. Unfortunately there was no music or even sound effect to accompany this otherwise good start.

On making a selection, the next snag became apparent – ArcTrivia expects to be in the default

drive, tricky if like me you have a hard disc, so it was back to the OS and *configure drive 0. It appears that, in order to allow use of extra question discs, ArcTrivia issues a *MOUNT before each disc access – if they made it *MOUNT 0 there would be no problem. Having made the necessary adjustment, I re-booted the disc and this time got into the game.

Start-up options

The game starts with a menu screen which allows you to select a set of questions (there are four sets on the disc), catalogue the questions directory, enter player's names, set whether correct answers will be displayed, choose difficulty level (actually the time allowed to answer), select sound on/off, get HELP about all of these and finally start the game. This menu consists of a set of icon boxes around the edge of screen with a small central box which draws graphic doodles whilst waiting for a user response, again there is no music. I catalogued the disc (which gives a *EX display – rather messy and could be improved) and entered General_K and then tried to start the game – no joy, you must enter at least one player's name before you can start. Having selected and loaded a set of questions, a list of categories appears in a new window on the screen and after entering players names, these too appear in their own window. The one option missing from this menu is exit, there is no way to leave the game except by pressing break (with shift or control).

With category and names entered, you can now start the game, the game screen consists of six windows, a large one for the question in the upper part of the screen (under which is a horizontal thermometer display of time allowed), a smaller one above it displaying current and highest scores and four smaller coloured windows below displaying the possible solutions. Answers appear to be randomly allocated to windows so that if the same question re-occurs there is no guarantee that the answer will be in the same box.

Gameplay

Gameplay is good and all under mouse control, questions appear on the screen at an easy reading speed and the countdown starts, accompanied by a sort of clock noise. Selection by mouse of the

correct answer gives a satisfyingly large "CORRECT" message whilst wrong answers or too great delays provide equally large "WRONG" or "TIME OUT" messages. In the case of wrong answers, the correct solution appears in a fifth window before the prompt to press a button for next question.

The faster you reply the more points you get. The available time varies according to whether you chose hard, moderate or easy from under 4 to almost 10 seconds. Each player has 3 'lives' which means that only 4 wrong answers may be given before the player is 'out'. Unlike a famous trivia board game, each player only answers one question before the next player has his or her turn, regardless of whether or not the given answer was correct and you have no way of influencing or choosing the subject of your question.

The game continues until all players have lost all four of their lives after which the score window slides to centre screen and, if appropriate, asks for the new highest scorer to enter his/her full name which is stored on disc. Another snag here was that if the original question file had been loaded using wild-cards in its filename, ArcTrivia will be unable to save the high-score file, this goes un-noticed at the time as errors are trapped but lead to some confusion when the file was not recalled. I feel it would be better if the catalogue routine were replaced by some form of mouse-selected menu which would avoid this.

Overall the game played well and there is a good selection of questions totaling 7000 over the four categories.

The Editor

The second part of the package is the Editor which is selected from the original menu page. Once loaded, the Editor presents another multi-windowed screen with mouse control of three sub-menus which allow loading, saving and cataloguing of the disc, stepping through the questions, going to a particular question, adding extra questions and editing existing questions.

If anything, the editor software is even better than the game. Question entry or amendment is straightforward and you are guided through the process in a particularly helpful manner. I was able to create a small question file of arithmetic tables (for my son to test drive you understand...) in a

matter of a very few minutes. As soon as you try to add a question to a blank file you are prompted for the up to six categories you wish to use and thereafter it is just a case of answering questions and trying to think up plausible wrong answers. Personally, I would consider buying the game just for this facility.

Conclusion - 1

In conclusion, the game is well thought out and plays well. The editor is most impressive and simple to use. My only quibbles are the lack of music of any sort, the auto-configuration, and a rather high percentage of spelling mistakes in some of the questions, all of these can be and should be remedied. If you like to while away the odd half-hour whilst waiting for inspiration this is a pretty fair way to do it.

(Just as an interesting comparison, I am adding the conclusion from a review which Philip Green sent in from Holland... Ed.)

Conclusion - 2

Anyone expecting an Archimedes version of "Trivial Pursuits" will be disappointed. Anyone expecting spell-checked questions and answers is in for a bigger disappointment (I have even seen one question with the correct answer accidentally tagged on to the end of the question). Anyone expecting visual or audio questions (even the ZX Spectrum version of Trivial Pursuits had these) is equally disappointed.

I keep telling myself I should not buy software until I have tried it out, but made that cardinal error again this time. My advice is not to buy ArcTrivia unless you have seen it and are sure it is worth the price to you.

(Interesting, isn't it? It just shows how important 'expectation' is in assessing a program. Philip was looking for an Archimedes version of Trivial Pursuits and was badly disappointed whereas John took it just at face value as an interesting Archimedes program and was moderately impressed. Having received the two conflicting reviews, I decided to try it out myself and try to give a casting vote. I suspect that, especially in educational surroundings, this program, which might have been better called "Question Box" or somesuch, could be prove very useful. Ed.) A

Shareware N°4 Review

Richard Forster

Shareware is an idea which has always interested me. With the small exception of groups who produce Shareware discs, it relies on people downloading the software over the phone. Unfortunately, however honest your comms enthusiast is, the system suddenly breaks down. Most people volunteer **not** to pay the voluntary contribution. Not surprisingly, this limits the average programmer's desire to release his/her masterpiece as public domain.

Charging a small amount for a shareware disc helps to eliminate this problem. Any final contribution to the programmers benevolent fund, can be left more safely to the user and his conscience. The only other problem encountered with shareware is the quality. It must be said however, that the rule, rather than the exception for the Archimedes, is for the software to be of good quality.

Shareware N°4

The software on the 'Shareware Disc N° 4' is no exception to the rule. There are a couple of black-spots, but there is also a myriad of bright ones. A reasonably wide spectrum of interests is covered, there being only one really specialist program. The disc contains two games, four pieces of graphics and four utility programs. Altogether it is to be highly recommended.

Birdlog – This is undoubtedly the pièce de resistance. The fact that I have no use for the program is irrelevant. It consists of the main program and a very comprehensive on-line manual. The main usefulness of Birdlog is claimed to be its, 'lightening of the clerical work involved in maintaining bird-records'.

The software is made 'to work'. On the disc there are many files to maximise memory, change fonts or get it to run under the desktop. The program itself offers a wide variety of options. The data can easily be manipulated and can automatically be analysed, to be displayed in a graph.

Operation throughout the program is quick and easy. I only once had to wait for it to deal with a particular data request. Overall, if you are interested in Birdwatching, the disc is worth buying solely for this program.

Patience – This was my personal favourite on this disc. My only criticism is the use of the mouse buttons. Once you know what they do, the game flows very quickly, however I couldn't find any reference as to what each button did. The graphical representation of each card is

good, the different picture cards being in the correct poses. The game had a very addictive feel to it and brought new enjoyment back to this old game.

Golf – I don't claim to know much about golf. There is a small white ball, some sticks and a hole, that's about all. The game however requires no more knowledge than this. It is quite playable, with pleasant graphics used throughout. The only confusing thing was that directions related to the 12hr clock and not to the keypad.

3D Mandlebrots – I did not think much of this. I am a great fan of fractal graphics etc but having several programs on the Archimedes which plot Mandlebrot's in seconds, I am not prepared to wait half an hour for a flimsy 3D version. The end result was not spectacular in the slightest. *(Partly my fault, sorry – the author said it was only a 'crude version' and that a more comprehensive set of 'Mand-scapes' is on its way. Ed.)*

Melting Shapes – This was the best of the graphics on this disc. The program allows you to enter several wire frame drawings and then it 'converts' one into another by gradually moving the lines. The instructions were adequate, and good use was made of the anti-aliased fonts. Three good examples are also supplied – messing about with these, helps to show off what the program can and can't do. I only wonder why the author chose an ice cream and an eskimo for the pointers.

All Things Graphical – A menu here would have been nice. Instead, all you get is a catalogue of the required directory. The programs were not that good, being simple BASIC graphic demos. Not the sort of thing you could use to show off the Archimedes.

Graphs – I'd come across this short BASIC program before. It's fast and the resulting graphs are pleasant to look at. It plots 3D graphs in either isometric or perspective and then normal or inverted. A nice program to explore.

First Word Plus Printer Driver Editor – This is the first of the utilities and is a powerful device to create First Word Plus printer drivers. As the software is only of use if you have First Word Plus, the author decided to make the manual only readable if you had First Word Plus. Once printed out from inside the wordprocessor it offers clear and concise details on usage. The program seemed very easy to use.

File Transfer & Sorting – Varied reaction to this one. It copies all files (which have valid file types) onto a

specified drive, creating a directory for each type of file. Possibly useful but *COPY seems to work just as well. A good idea if you plan to leave the copying unattended.

Character Editor—This is an easy to use, mouse driven character editor. It offers some simple options like inverse (but no rotation of any kind!). The end character set can then be spooled as a list of VDU 23's. Help is

given on each option by simply pressing the middle mouse button.

A Program to Explore—Short and sweet! This program has two procedures which open and close special windows. The program only works in mode 12, but the sheer ease of use and simple raw power makes them a quick and attractive option when using windows. **A**

Overload Review

Victor Montefiore

Overload is yet another addition to the range of Archimedes games. Although the plot is not original, being copied from an Amiga game whose name escapes me, which sets a few standards for the Archimedes version.

After loading the game, a menu is displayed giving a pretty volume level bar controlled by the cursor keys, and an option to enter a password. Each password enables you to start from the next set of five screens.

Gameplay

The gameplay is simple; you control a bouncing ball and have to hit moving monsters which roam about the screen. The display is divided into areas by walls, preventing you from hitting the monsters with ease. The ball has to be guided round the obstacles by controlling its motion using <Z> for left, <X> for right and <return> to make the ball bounce higher or not so high. If you hit <return> while the ball is on its way up, it bounces higher and if you hit the key whilst the ball is moving down, it does not come up quite as high after bouncing.

Control of the ball is difficult, even with practice, although after a while an understanding develops between your brain, your fingers and the ball, enabling you to work out the necessary direction and strength of bounce needed to rebound into position for hitting the next monster. The monsters have to be hit in a certain order, the next one needing to be crushed has a white dot above it. However, if you hit a monster out of turn, it

splits into two, creating extra work since they then have to be squashed in the right order, but never immediately after each other. At the top of the screen is the current level number, the level started from and a counter showing the time remaining to hit all of the monsters on that screen.

Sound

The sound in the game is adequate; there are a few good samples, namely a cackle as the game is started, and a 'boing' as the ball rebounds. Games on powerful machines should include good music, but this has not been the policy of many Archimedes games writers so far. (*Pacmania is one notable exception. Ed.*)

Graphics

The graphics in the game give the same impression of a lack of resourcefulness, as the sprites are simple, the backgrounds too, and a limited range of colour is used on each level not giving any perspective. Despite this, the detail is impressive, with good use of resolution. Very little of the Archimedes' potential has been used and its success relies on its addictiveness.

Like many of the simple games, it is compellingly addictive; there is no giving up trying to get to the next level, the next password. Because of this quality, at £14.95 (£14 through Archive) the game is worth buying. This is a game you will keep playing, unlike some which lose their appeal after a few hours. (RISC-OS compatible.) **A**

Cheat it Again, Archie

Alan Glover

Cheat It Again Archie, from Impact Software, is a collection of twelve cheats for games programs. So what is a 'cheat'? Here it is something which makes the game easier to play and allows you to progress further into the game, for example, by giving you a selected number of or even infinite lives, or the ability to start from a higher level in the game.

All these cheats are used in conjunction with the original software discs, using various devious programming techniques to patch the game code as it loads.

Cheats are included for the following games:

- **Alerion** (Dabs Press) – Infinite lives
- **Conqueror** (Superior) – Allows you to alter the tank specification

- **Fireball** (Godax) – Choose the starting level
- **Freddy's Folly** (Minerva) – The rails on which the canon runs cannot be damaged by the ship's canon balls.
- **Hoverbod** (Minerva) – Allows you to jump levels or obtain the spray can. (Also includes the passwords.)
- **Minotaur** (Minerva) – Infinite food, dead minotaur at start of game, begin with map/compass/sword and choose number of men to rescue.
- **Orion** (Minerva) – Any start wave, infinite/any number of lives, any number of bombs.
- **Pacmania** (Grandslam) – Immortality, infinite/any number of lives, infinite/any number of credits.
- **Quazer** (Impact) – Immortality, or any number of lives, and starting on any level. N.B. these cheats only apply to Impact versions of Quazer. Pokes for the original versions of Quazer have been published in earlier editions of Archive. A list of passwords is given too, but it is incorrect! The password for the last level (11) begins with an R not a P. (I didn't want to tell you the password itself in case you didn't want to know it!).
- **Star Trader** (Gem Electronics) – Allows you to choose how many credits you begin with.
- **Terramex** (Grandslam) – Gives infinite/any number of lives.
- **Zarch** (Superior) – Infinite/any number of lives, infinite/any number of bombs, infinite/any number of missiles and starting on any wave.

In addition to the cheats on the disc, the built-in cheats present in many of these games are also mentioned.

In all cases, installing the cheat is a simple matter of clicking on the game name from the menu screen. Information describing the cheat then appears on the screen. Once the cheat has been selected, the machine will usually reset itself and then run the selected cheat program from disc.

You may then select the features you want and, finally, you are told when to insert the original game disc. The game will then load with the cheat in effect. Providing that the instructions given on-screen are followed exactly, loading is reliable and straight-forward.

This has been a very difficult review to write, because whilst experimenting with the cheats, the temptation is always there to just see what the next level looks like. Indeed, one of the biggest points in favour of cheats is that they can bring back life to a game previously written off as being too hard, or impossible to play at all.

There are a couple of signs of a rushed release (e.g. a misspelling and the mistake on the Quazer password already mentioned), but the technical side of the product seems perfect.

Whether it is worth getting (£11 through Archive) depends ultimately on how many of the featured games you possess, but it can certainly be recommended for getting the dust blown off games which had been abandoned! **A**

What price Shareware?

The idea of the Shareware discs and the monthly program discs is that the software should be spread as freely as possible to as many people as possible. So, in response to a request from the Archimedes User Group in Holland (part of the Big Ben Club), I am suggesting to them and to any other interested User Groups, a way of improving the distribution.

The idea would be that the group would order one disc from us each month (and/or one copy of each Shareware disc as it comes out) and then copy it freely to their members, making a charge to cover admin and/or the cost of the disc. There would be no royalty payments, but would ask that the group should give full acknowledgement to us and also give, say, 50p to charity for each disc they distribute. Any groups interested should drop us a line or give us a ring.

Keep the Shareware coming!

We are beginning to do more specialist discs. N°5 is music, and N°6 is First Word Plus stuff. The more reticent among you, write to ask if we would like to receive your programs and the answer is always, "yes, please". As long as the programming is reasonable and you put some sort of documentation with it, it is useful. After all, I am sure that people accept that at £3 a disc, they are not expecting "professional" software.

Fact-File

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